

DECEMBER 1931

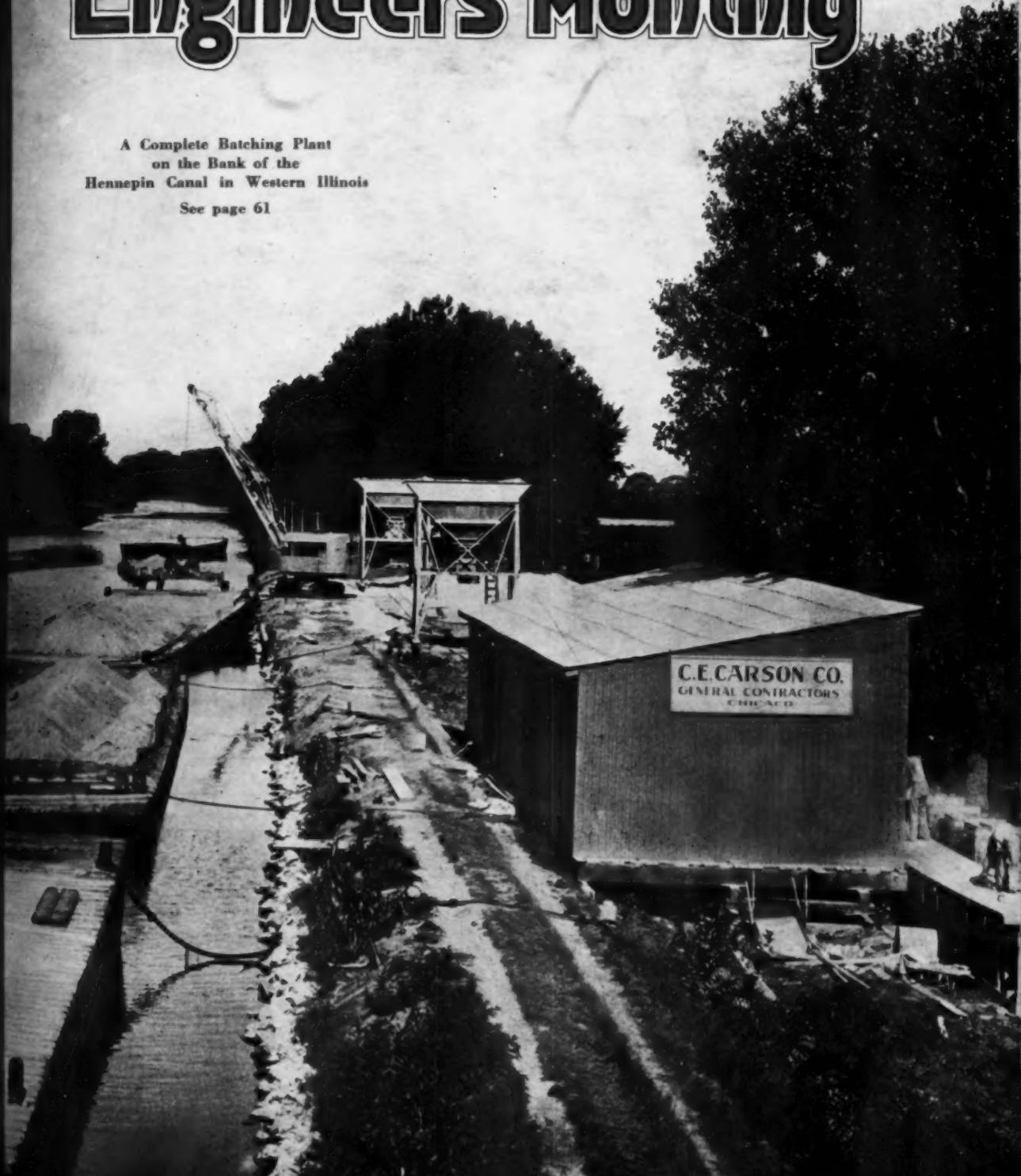
25 Cents, \$1 a Year

7TH TIER

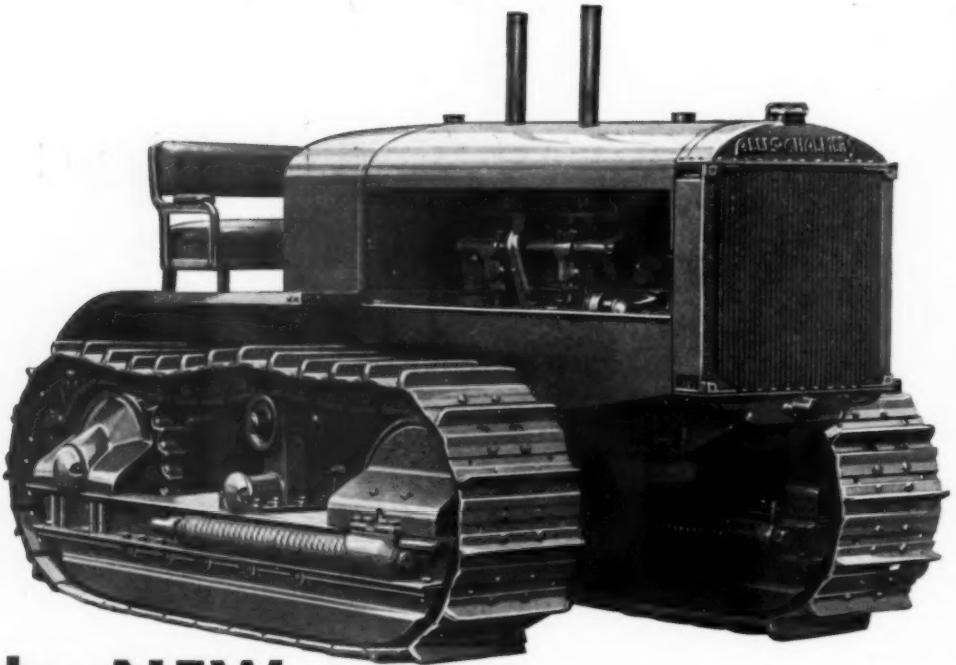
Contractors and Engineers Monthly

A Complete Batching Plant
on the Bank of the
Hennepin Canal in Western Illinois

See page 61



6 SPEEDS - 6 CYLINDERS



in the NEW HEAVY DUTY FAST MODEL "L" TRACTOR

Think what it means on a dirt-moving job — in many cases three round trips from load to dump while other tractors make two — hauling more — moving more dirt on each single trip.

When you realize that Allis-Chalmers Model "L" Tractors have been in the toughest kind of service well over 4,000 hours — with practically no repair ex-

pense — you know they are built to last.

Consider these Model "L" features — high road clearance, unit construction — no frame or subframes, easy accessibility to all working parts, valve in head engine and replaceable cylinder liners.

It's a knockout! Allis-Chalmers Dealers are ready to show you —

Allis-Chalmers

MILWAUKEE, U. S. A.

TRACTOR POWER FOR EVERY PURPOSE



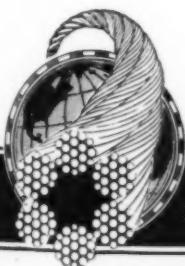
Williamsport Wire Rope

Good engineers know there's a vast difference in various makes of wire rope and the service it renders.

The point we wish to leave with you is that our interest in the manufacture of wire rope is not divided. . . .

We make wire rope only—nothing else, and we concentrate our facilities and train our men to perfection in this task.

May we send you our latest catalog and data book which tells you a lot more about Williamsport Quality?



WILLIAMSPORT WIRE ROPE CO.

Main Office and Works

WILLIAMSPORT, PA.

General Sales Offices

PEOPLES GAS BLDG., CHICAGO

Do you mention CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

WHERE TO PURCHASE - - -

Bins, Storage (Cont.)

Johnson Co., C. S., Champaign, Ill.
Lancaster Iron Works, Inc., Lancaster, Pa.
Link-Belt Co., Chicago
Merriman Asphalt Plant, Inc., Lima, Ohio
Neff & Fry Co., Camden, Ohio
Pittsburgh-Des Moines Steel Co., Pittsburgh
Seaview Co., Jas. B., Batavia, Ill.
Universal Rd. Machy. Co., Kingston, N. Y.
Webster & Weller Mfg. Co.'s, Chicago
Western Wheeled Scraper Co., Aurora, Ill.

Bits, Detachable, for Drills

Detachable Bit Corp. of Amer., New York

Black Powder (See Powder)

Blades, Grader and Snow Plow

*Austin-Western Road Machy. Co., Chicago
*Caterpillar Tractor Co., Peoria, Ill.
*General Wheelbarrow Co., Cleveland, Ohio
*Biddle Co., W. A., Bucyrus, Ohio
*Shunk Mfg. Co., Bucyrus, Ohio
Adams Co., J. D., Indianapolis, Ind.
Beach Mfg. Co., Charlotte, Mich.
Galion Iron Wks. & Mfg. Co., Galion, Ohio
Good Roads Machinery Co., Kennett Sq., Pa.
Northfield Iron Co., Northfield, Minn.
Western Wheeled Scraper Co., Aurora, Ill.

Blast Hole Drills (See Drills)

Blasting Powder (See Powder, Black)

Block Machines, Concrete

Abams Cement Tool Co., Detroit, Mich.
Cement Block Machine Co., Newark, N. J.
Foste Fdy. Co., J. B., Fredericktown, Ohio
Larsen Co., Lansing, Mich.
Zaehmeyer Cast Stone Block Machy. Co.,
Lay City, Mich.

Block Paving, Asphalt

Asphalt Brick Co., St. Louis, Mo.
Hastings Pavement Co., New York

Block Paving, Brick (See Brick)

Block Paving, Granite

Fletcher Co., H. E., West Chelmsford, Mass.
Leopold & Co., J., New York
Long-Blue Granite Quarries, Inc., Elberton, Ga.
Maine & N. H. Granite Corp., N. Jay, Maine
Wisconsin Granite Co., Chicago
Woodbury Granite Co., Hardwick, Vt.

Block Paving, Rubber

*Servicized Products Corp., Chicago
Wright Rubber Prod. Co., Racine, Wis.

Block Paving, Wood

Jennison-Wright Co., Toledo, Ohio
Pacific Creo. Co., Seattle, Wash.
Republic Creo. Co., Indianapolis, Ind.
Southern Wood Prod. Co., Atlanta, Ga.
White Lumber Co., J. J., Columbia, Miss.
Wyckoff Pipe & Creo. Co., New York

Blocks and Tackle (See also Chains, Block, and Rope, Manile)

*Lidgerwood Mfg. Co., Elizabeth, N. J.
*Western Block Co., Lockport, N. Y.
*Williamsport Wire Rope Co., Chicago
American Hoist & Dér. Co., St. Paul, Minn.
Boston & Lockport Block Co., Boston, Mass.
Clyde Iron Works Sales Co., Duluth, Minn.
Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
Ebel Hoist and Pump Co., Lansing, Mich.
Fridy Hoist & Machy. Co., Mountville, Pa.
Hains Mfg. Co., Geo., New York
Iowa Mfg. Co., Cedar Rapids, Iowa
Lechner & Sons Rope Co., St. Louis, Mo.
Moebling's Sons Co., John A., Trenton, N. J.
Stuebner Iron Wks., G. L., Long Is. City, N. Y.
Upson-Walton Co., Cleveland, Ohio

Blocks, Wood, Creosoted (See Wood, Creosoted, and Block Paving, Wood)

Blocks, Sewer, Segment

American Vit. Prods. Co., Akron, Ohio
Dickey Clay Mfg. Co., W. S., Kansas City, Mo.
Evans & Howard Fire Brick Co., St. Louis, Mo.
Laclede Christy Clay Prod. Co., St. Louis, Mo.
Pacific Clay Prod. Co., Los Angeles, Calif.
Red Wing Sewer Pipe Co., Red Wing, Minn.
Robinson Clay Prod. Co., Akron, Ohio
Streator Clay Mfg. Co., Streator, Ill.
Washington Brick, Lime & Sewer Pipe Co.,
Spokane, Wash.

Blow Torches (See Torches)

Blowpipes, Cutting and Welding (See Welding Apparatus, Acetylene)

Blueprint Machines

Bruning Co., Charles, New York
Paragon-Revolute Corp., Rochester, N. Y.
Pense Co., U. T., Chicago
Shaw Bldg. Print Mach. Co., Campbell, N. J.
Wickes Bros., Saginaw, Mich.

Sodas, Concrete, Agitator and Mixer

*Blaw-Knox Co., Pittsburgh, Pa.
*Davis, Inc., Norris K., San Francisco, Calif.
Jaeger Machine Co., Columbus, Ohio
Arrow Sand & Gravel Co., Columbus, Ohio
Sarrymore Cone Mixer Corp., San Francisco,
Calif.
Biehl Iron Works, Reading, Pa.
Chain Belt Co., Milwaukee, Wis.
Clinton Motors Corp., Reading, Pa.
Federal Motor Truck Co., Detroit, Mich.
Good Roads Machinery Co., Kennett Sq., Pa.
Lee Highway Truck Mixer Co., Cleveland, Ohio
Lee Transit Mixer Co., Indianapolis, Ind.
Parke Conc. Carrier, Inc., New York
Portland Concrete Machines Co., Cleveland, O.
Transit Mixers, Inc., San Francisco, Calif.
Truck Mixer Co., Columbus, Ohio

Bodies, Dump, for Motor Trucks

*Littleford Bros., Cincinnati, Ohio
*Nelson Iron Works, N. P., Passaic, N. J.
*Wood Hydr. Hoist & Body Co., Detroit
American Cement Mach. Co., Keokuk, Iowa
American Truck Body Co., Martinsville, Va.
Anthony Co., Streator, Ill.
Columbian Steel Tank Co., Kansas City, Mo.
Commercial Shearing & Stamping Co., Young-
town, Ohio
Divitler Mfg. Co., Galion, Ohio
Eagle Wagon Works, Auburn, N. Y.
Galion All Steel Body Co., Galion, Ohio
Heil Co., Milwaukee, Wis.
Hercules Products Inc., Evansville, Ind.
Highway Trailers Co., Edgerton, Wis.
Hockingsmith Wheel & Mfg. Car Co., Penn, Pa.
Hug Co., The, Highland, Ill.
Lee Trailer & Body Co., Plymouth, Ind.
Marion Steel Body Co., Marion, Ohio
Superior Body Corp., Marion, Ind.
Van Dorn Iron Works Co., Cleveland, Ohio

Bodies, Dump, Tractor-Mounted

*Austin-Western Road Machy. Co., Chicago
*Marion Mules, Inc., Marion, Ohio
*Shunk Mfg. Co., Bucyrus, Ohio
Hughes-Keanan Co., Mansfield, Ohio
Koehring Co., Milwaukee, Wis.
Ohio Loco. Crane Co., Bucyrus, Ohio

Boilers

Babcock & Wilcox Co., New York
Burnham Boiler Corp., Irvington, N. Y.
Clyde Iron Works Sales Co., Duluth, Minn.
Cole Mfg. Co., R. D., Newnan, Ga.
Erie City Iron Wks., Erie, Pa.
Farquhar Co., Ltd., A. B., York, Pa.
Hartley Boiler Wks., Montgomery, Ala.
Hedges-Walsh-Weidner Co., Chattanooga, Tenn.
Heine Boiler Co., St. Louis, Mo.
Johnston Bros. Inc., Ferrysburg, Mich.
Keeler Co., E., Williamsport, Pa.
Loffel & Co., Jas., Springfield, Ohio
Manitowoc Engg. Wks., Manitowoc, Wis.
Murray Iron Wks. Co., Burlington, Iowa
Nagle Eng. & Boiler Works, Erie, Pa.
Orr & Embower, Reading, Pa.
Schonfeld's Sons Co., J. S., Macon, Ga.
Standwood Corp., Cincinnati, Ohio
Vogt Machinery Co., Inc., Louisville, Ky.

Boxes, Batch

*Blaw-Knox Co., Pittsburgh, Pa.
*Honhorst Co., Jas., Cincinnati, Ohio
*Lakewood Engg. Co., Columbus, Ohio
*Littleford Bros., Cincinnati, Ohio
*Truscon Steel Co., Youngstown, Ohio

Anchor Mfg. Co., Chicago, Ill.
Beatrice Steel Tank Mfg. Co., Beatrice, Neb.
Donley Bros. Co., Cleveland, Ohio
Empire Metal Tank Works, E. Rochester, N. Y.
Fairbanks Co., New York
Hancock Iron Works, Pontiac, Mich.
Jackson Mfg. Co., Harrisburg, Pa.
Lansing Co., Lansing, Mich.
Red Star Prods. Corp., Cleveland, Ohio
Union Iron Works, Inc., Hoboken, N. J.

Braces, Trench

Channon Mfg. Co., Jas. H., Chicago
Duff-Norton Mfg. Co., Pittsburgh, Pa.
Kalamazoo Fdy. & Mach. Co., Kalamazoo, Mich.
Templeton, Kenly & Co., Chicago

Branding Tools

Everhot Mfg. Co., Maywood, Ill.

Brass Goods

Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Cop. Co., Waterbury, Conn.
Glauber Brass Mfg. Co., Cleveland, Ohio
Haydenville Co., Haydenville, Mass.
Mueller Co., Erie, Pa.
Mueller Co., Decatur, Ill.
Smith Mfg. Co., A. P., East Orange, N. J.
Union Water Meter Co., Worcester, Mass.
United-Obendorf Corp., Cleveland, Ohio
Waterbury Brass Goods Corp., Waterbury,
Conn.

Breakers, Concrete, Pneumatic (See Tools Pneumatic)

Brick, Paving, Vitrified

Alton Brick Co., Alton, Ill.
Buffalo Brick Co., Buffalo, N. Y.
Cleveland Brick & Clay Co., Cleveland, Ohio
Collinwood Shale Brick Co., Cleveland, Ohio
Corry Brick & Tile Corp., Corry, Pa.
Crescent Brick Co., Pittsburgh, Pa.
Georgia Vit. Brick Co., Augusta, Ga.
Globe Brick Co., E., Liverpool, Ohio
Hammond Fire Brick Co., Fairmont, W. Va.
Hsylvania Coal Co., Columbus, Ohio
Hocking Valley Brick Co., Columbus, Ohio
McAvoy Brick Co., Bridgeville, Pa.
Mayer Brick Co., Bridgeville, Pa.
Metropolitan Paving Brick Co., Canton, Ohio
Murphyboro Pav. Brick Co., Murphyboro, Ill.
National Pav. Brick Mfrs. Assn., Washington
Patton Clay Mfg. Co., Patton, Pa.
Patton Brick Co., Watertown, Pa.
Peebles Paving Brick Co., Portsmouth, Ohio
Peoria Brick & Tile Co., Peoria, Ill.
Purlington Pav. Brick Co., Galesburg, Ill.
Rose Shale Brick Co., Veedersburg, Ill.
So. Clay Mfg. Co., Chattanooga, Tenn.
Springfield Paving Brick Co., Springfield, Ill.
Sterling Brick Co., Olean, N. Y.
Streator Clay Mfg. Co., Streator, Ill.
Terra Haute Vit. Brick Co., Terra Haute, Ind.
Thornton Fire Brick Co., Clarksburg, W. Va.
Thurber Brick Co., Thurber, Texas
Toronto Fire Clay Co., Toronto, Ohio
Trinidad Brick & Tile Co., Trinidad, Ohio
United Clay Products Corp., Kansas City, Mo.
Western Shale Prods. Co., Ft. Scott, Kans.

Bridge Cables (See Cables)

Bridge Floors (See Flooring, Bridge; Block Paving, Wood; Wood, Creosoted)

Bridges, Traveling, for Road Work

*Heltzel Steel Form & Iron Co., Warren, Ohio
*Lakewood Engg. Co., Columbus, Ohio

Brooms, Hand

*Hvass & Co., Inc., Chas., New York
Durlach Can & Iron Wks., Brooklyn, N. Y.
Kendallville Brush & Broom Co., Kendall-
ville, Ind.
Lay Co., Joseph, Portland, Ind.
Milwaukee Brush Mfg. Co., Milwaukee, Wis.
Mohawk Asphalt Heater Co., Schenectady, N. Y.
Osborn Mfg. Co., Cleveland, Ohio
Wolfe Brush Co., Pittsburgh, Pa.

Brush Cutters (See Cutters)

Bucket Conveyors (See Conveyors)

Bucket Elevators (See Elevators)

Bucket Excavators (See Excavators or Con- veyors)

Buckets, Automatic Dumping

*Lakewood Engg. Co., Columbus, Ohio
*Williamsport Wire Rope Co., Williamsport, Pa.
Biehl Iron Works Corp., Reading, Pa.
Inslay Mfg. Co., Indianapolis, Ind.
Link-Belt Co., Chicago
Stuebner Iron Wks., Inc., G. L. L. I. City, N. Y.

An AID to Winter CONCRETING

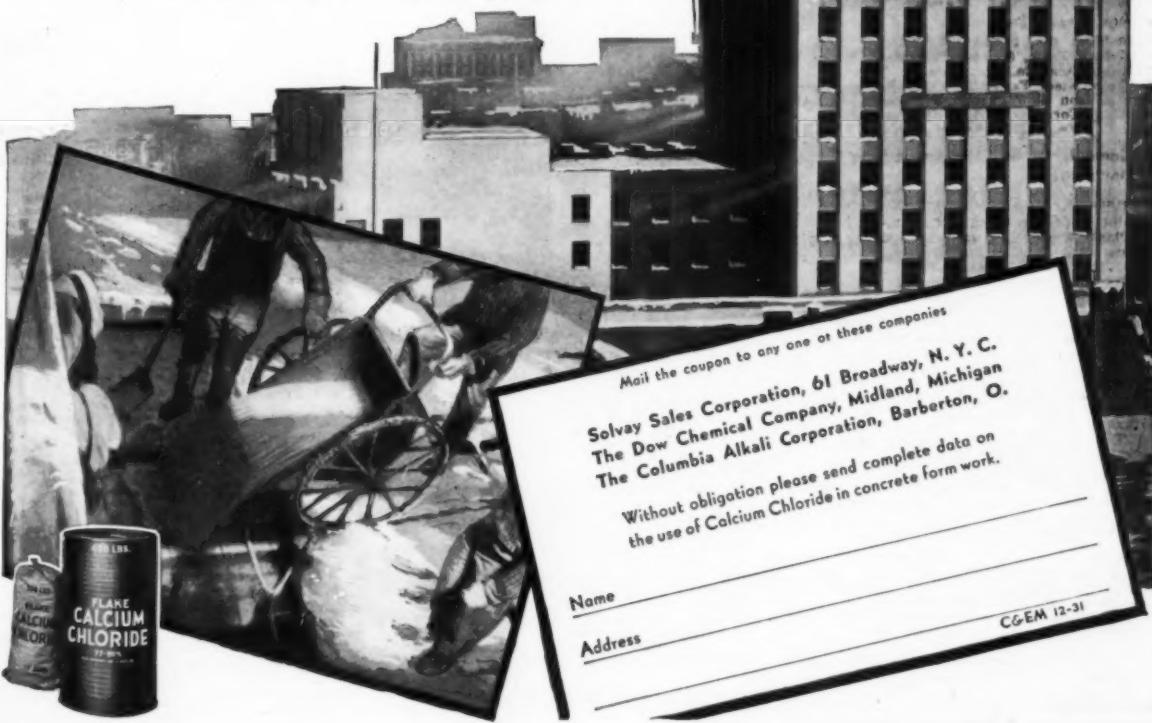
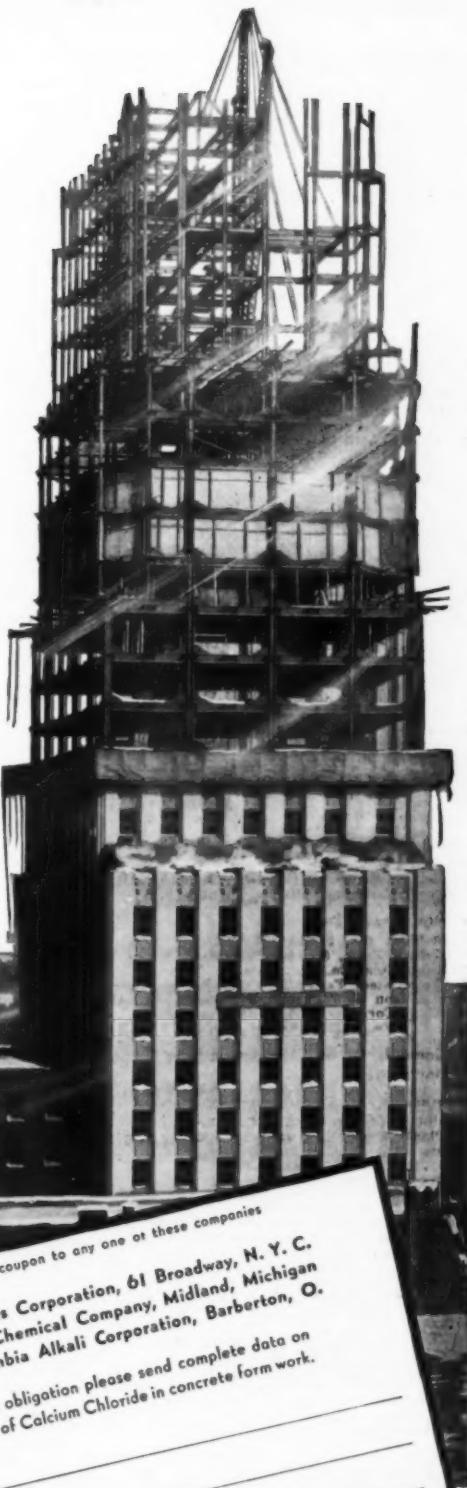
THE WIND is howling outside. Tarpaulins have been pulled around the sides of the building where the concrete work is going on. The temperature is flirting with the freezing zone . . . not a very propitious time for concrete form work.

Here again the use of Calcium Chloride in the mix is a great advantage. It accelerates the set and develops full strength concrete more quickly, thus helping to minimize the danger of freezing.

It is noteworthy, too, that Calcium Chloride more thoroughly hydrates the mix thus producing stronger concrete throughout the whole mass. This is an advantage in upright concrete form work where it is difficult, by ordinary means, to keep the inner mass sufficiently moist to effect a complete cure.

Since contractors and builders have become familiar with these principles, the value of using Calcium Chloride in concrete form work has been widely recognized. Complete data on this timely subject will be gladly furnished you free of cost. Just send the handy coupon.

Calcium Chloride Publicity Committee



Mail the coupon to any one of these companies
 Solvay Sales Corporation, 61 Broadway, N. Y. C.
 The Dow Chemical Company, Midland, Michigan
 The Columbia Alkali Corporation, Barberton, O.

Without obligation please send complete data on
 the use of Calcium Chloride in concrete form work.

Name _____
 Address _____
 C&EM 12-31

WHERE TO PURCHASE

Buckets, Cableway, Slackline

- *Blaw-Knox Co., Pittsburgh, Pa.
- *Hayward Co., New York
- *Sauer Bros., Chicago, Ill.
- Beaumont Co., R. H., Philadelphia
- Bucyrus-Monaghan Co., Chicago
- Godfrey Conveyor Co., Elkhart, Ind.
- Harnischfeger Corp., Milwaukee, Wis.
- Link-Belt Co., Chicago
- Street Bros. Mach. Wks., Chattanooga, Tenn.
- Williams Co., G. H., Erie, Pa.

Buckets, Clam-Shell

- *Blaw-Knox Co., Pittsburgh, Pa.
- *Hayward Co., New York
- *Lakewood Engg. Co., Columbus, Ohio
- Browning Crane Co., Cleveland, Ohio
- Eric Steel Const. Co., Erie, Pa.
- Haisl Mfg. Co., Geo., New York
- Industrial Brownhoist Corp., Cleveland
- Kiesler Co., J. F., Chicago
- Link-Belt Co., Chicago, Ill.
- Manitowoc Engg. Wks., Manitowoc, Wis.
- Mead-Morrison Mfg. Co., E. Boston, Mass.
- Orton Crane & Shovel Co., Chicago
- Owen Bucket Co., Cleveland, Ohio
- Page Engg. Co., Chicago
- Williams Co., G. H., Erie, Pa.

Buckets, Dredging

- *Blaw-Knox Co., Pittsburgh, Pa.
- *Hayward Co., New York
- *Lakewood Engg. Co., Columbus, Ohio
- Browning Crane Co., Cleveland, Ohio
- Eric Steel Const. Co., Erie, Pa.
- Haisl Mfg. Co., Geo., New York
- Industrial Brownhoist Corp., Cleveland, Ohio
- Kiesler Co., J. F., Chicago
- Link-Belt Co., Chicago
- Orton Crane & Shovel Co., Chicago
- Owen Bucket Co., Cleveland, Ohio
- Stockton Iron Works, Stockton, Calif.
- Williams Co., G. H., Erie, Pa.

Buckets, Hoist, Concrete

- *Davis, Inc., Morris K., San Francisco, Calif.
- *Jaeger Machine Co., Columbus, Ohio
- *Lakewood Engg. Co., Columbus, Ohio
- *Ransome Conc. Machy. Co., Dunellen, N. J.
- Inasley Mfg. Co., Indianapolis, Ind.
- Stuebner Ir. Wks., Inc., G. L., L. I. City, N.Y.
- Union Iron Works, Inc., Hoboken, N. J.

Buckets, Orange-Peel

- *Hayward Co., New York
- Industrial Brownhoist Corp., Cleveland, Ohio
- Orton Crane & Shovel Co., Chicago

Buildings, Steel, Portable

- *Blaw-Knox Co., Pittsburgh, Pa.
- *Littleford Bros., Cincinnati, Ohio
- *Truscon Steel Co., Youngstown, Ohio
- Beatrice Steel Tank Mfg. Co., Beatrice, Neb.
- Ingalls Iron Works Co., The, Birmingham, Ala.
- St. Paul Corrugating Co., St. Paul, Minn.
- Superior Engg. Co., Warren, Ohio

bulk Cement Handling Equipment (See Cement Handling)

Bulldozers

- *Euclid Road Machy. Co., Cleveland, Ohio
- *Plant-Cheate Mfg. Co., Inc., Cedar Rapids, Iowa
- *Trackson Co., Milwaukee, Wis.
- Baker Mfg. Co., Springfield, Ill.
- Blair Mfg. Co., W. M., Chicago
- Davis Mfg. Co., Davis, Calif.
- Essex Engine & Machine Co., Belleville, N. J.
- Foote Bros. Gear & Machine Co., Chicago
- Miami Trailer-Scraper Co., Troy, Ohio
- Niess & Co., Inc., Minneapolis, Minn.
- W.K.M Co., Houston, Texas
- Woodridge Mfg. Co., Los Angeles, Calif.

Bunks and Cots

- Pitt. Pitt Bedding Co., Pittsburgh, Pa.
- Haggard & Marcuson Co., Chicago
- Logan Co., Louisville, Ky.
- Royal Blue Bed Spring Co., Cincinnati, Ohio
- Seattle Tent, Awning Co., Seattle, Wash.
- Simmons Co., New York
- Southern-Rome Co., Baltimore, Md.

Burlap

- American Sack Corp., Chicago
- Eastern Burlap Bag Co., Hartford, Conn.
- Fulton Bag & Cotton Mills, Atlanta, Ga.
- Mente & Co., Inc., New Orleans, La.
- Upson-Walton Co., Cleveland, Ohio

Cable (See Wire and Cable, Electric, or Rope, Wire)

Cable, Bridge

- *American Steel & Wire Co., Chicago
- Boehling's Sons Co., John A., Trenton, N. J.
- Cast Iron Pipe (See Pipe)

Cableway Buckets, Slackline (See Buckets)

Cableways, Dragline

- *Diamond Iron Works, Inc., Minneapolis, Minn.
- *Lidgerwood Mfg. Co., Elizabeth, N. J.
- *McKiernan-Terry Corp., New York
- *Pioneer Gravel Equip. Mfg. Co., Minneapolis
- *Sauer Bros., Chicago
- Amer. Hoist & Derrick Co., St. Paul, Minn.
- Beach Mfg. Co., Charlotte, Mich.
- Beaumont Co., R. H., Philadelphia
- Green, L. P., Chicago
- Iowa Mfg. Co., Cedar Rapids, Iowa
- Link-Belt Co., Chicago
- Pioneer Gravel Equip. Mfg. Co., Minneapolis
- Street Bros. Mach. Wks., Chattanooga, Tenn.

Cableways, Slackline

- *Lidgerwood Mfg. Co., Elizabeth, N. J.
- *McKiernan-Terry Corp., New York
- *Sauer Bros., Inc., Chicago
- Beaumont Co., R. H., Philadelphia, Pa.
- Mundy Hoisting Eng. Co., J. S., Newark, N. J.
- Street Bros. Mach. Wks., Chattanooga, Tenn.

Cabs, Motor Truck

- Highland Body Mfg. Co., Cincinnati, O.
- Martin-Parry Corp., York, Pa.
- Moline Mfg. Co., Moline, Ill.
- Stewart Iron Works Co., Cincinnati, O.
- Weatherproof Body Corp., Corunna, Mich.

Caissons

- American Bridge Co., New York
- Biggs Boiler Wks. Co., Akron, Ohio
- Birmingham Tank Co., Birmingham, Ala.
- Petroleum Iron Works Co., Sharon, Pa.
- Pittsburgh-Des Moines Stl. Co., Pittsburgh, Pa.

Calcium Chloride

- *Columbia Products Co., Barberton, Ohio
- *Dow Chemical Co., Midland, Mich.
- *Solvay Sales Corp., New York
- Michigan Alkali Co., New York

Calcium Chloride Spreaders (See Spreaders)

Calking Compounds (See Compounds)

Calking Machinery and Tools

- *Independent Pneu. Tool Co., Chicago
- *Schramm, Inc., West Chester, Pa.
- Chicago Pneu. Tool Co., New York
- Helwig Mfg. Co., St. Paul, Minn.
- Ingersoll-Rand Co., New York
- Mueller Co., Decatur, Ill.
- Smith Mfg. Co., A. P., East Orange, N. J.

Canvas

- Canvas Prods. Co., St. Louis, Mo.
- Daniels, Inc., C. R., New York
- Fulton Bag & Cotton Mills, Atlanta, Ga.
- Goss Co., J. C., Detroit, Mich.

Car Unloaders (See Unloaders)

Cars, Industrial Railway

- *Lakewood Engg. Co., Columbus, Ohio
- Atlas Car & Mfg. Co., Cleveland, Ohio
- Case Crane & Engg. Co., Columbus, Ohio
- Chase Fdy. & Mfg. Co., Columbus, Ohio
- Easton Car & Const. Co., Easton, Pa.
- Hunt Co., C. W., West New Brighton, N. Y.
- Inasley Mfg. Co., Indianapolis, Ind.
- Koppel Ind. Car & Equip. Co., Koppel, Pa.
- Stuebner Ir. Wks., Inc., G. L., L. I. City, N.Y.
- Union Iron Works, Hoboken, N. J.
- United Iron Works, Inc., Kansas City, Mo.
- Western Wheeled Scraper Co., Aurora, Ill.
- Whiting Corp., Harvey, Ill.

Carts, Concrete

- *General Wheelbarrow Co., Cleveland, Ohio
- *Lakewood Engg. Co., Columbus, Ohio
- *Ransome Conc. Machy. Co., Dunellen, N. J.
- Acme Road Machy. Co., Frankfort, N. Y.
- Chattanooga Wheelbarrow Co., Chattanooga, Tenn.
- Gray Iron Fdy. Co., Reading, Pa.
- Inaley Mfg. Co., Indianapolis, Ind.
- Jackson Mfg. Co., Harrisburg, Pa.
- Lansing Co., Lansing, Mich.
- Red Star Prods. Corp., Cleveland, Ohio
- Sterling Wheelbarrow Co., Milwaukee, Wis.
- Toledo Wheelbarrow Co., Toledo, Ohio

Carts, Dump (See Wagons)

If you find any errors or omissions in this Where to Purchase list, please send corrections to CONTRACTORS AND ENGINEERS MONTHLY

Cast Iron Culverts (See Culverts or Pipe)

Castings, Steel

- *Riddell Co., W. A., Bucyrus, Ohio
- Alloy Cast Steel Co., Marion, Ohio
- American Manganese Steel Co., Inc., Chicago Hts., Ill.
- Chain Belt Co., Milwaukee, Wis.
- Farrel Check Steel Fdy. Co., Sandusky, Ohio
- Foote Bros. Gear & Machine Co., Chicago
- Hardie-Tynes Mfg. Co., Birmingham, Ala.
- Otin Steel Co., Cleveland, Ohio
- Rogers Iron Wks. Co., Joplin, Mo.
- Smith Steel Casting Co., Geo. H., Milwaukee, Wis.
- Wheeling Mold & Fdy. Co., Wheeling, W. Va.

Castings, Street and Sewer

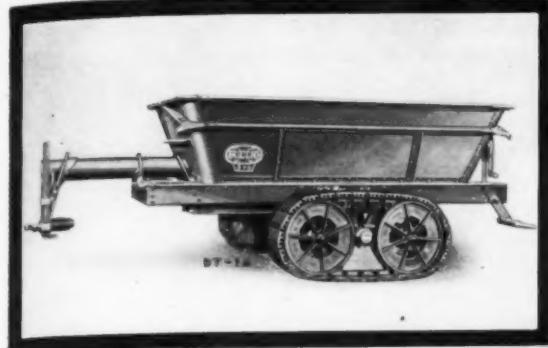
- *Burch Corp., The, Crestline, Ohio
- *U. S. Pipe & Fdy. Co., Burlington, N. J.
- Central Foundry Co., New York
- Clark Co., H. W., Mattoon, Ill.
- Clarksville Fdy. & Mach. Co., Clarksville, Tenn.
- Clow & Sons, J. B., Chicago
- Dee Co., Wm. E., Chicago
- Donley Bros. Co., Cleveland, Ohio
- Flockhart Fdy. Co., Newark, N. J.
- Fulton Iron Works, St. Louis, Mo.
- Lake Shore Eng. Works, Marquette, Mich.
- Rogers Iron Wks. Co., Joplin, Mo.
- Sessions Fdy. Co., Bristol, Conn.
- South Bend Fdy. Co., South Bend, Ind.

Catch Basins (See Castings, Street and Sewer)

Cement

- *Columbia Cem. Div. of Pittsburgh Plate Glass Co., Pittsburgh
- *Universal Atlas Cement Co., Chicago
- Acme Cement Corp., Castill, N. Y.
- Altna P. C. Co., Detroit, Mich.
- Allentown P. C. Co., Catawissa, Pa.
- Alpha P. C. Co., Easton, Pa.
- Ash Grove Lime & P. C. Co., Kansas City, Mo.
- Atlas P. C. Co., New York
- Basic Products Co., Pittsburgh, Pa.
- Beaver P. C. Co., Portland, Ore.
- Bessemer Limestone & C. Co., Youngstown, O.
- British Columbia Cement Co., Victoria, B. C.
- Canada Cement Co., Ltd., Montreal, Canada
- Colorado P. C. Co., Denver, Colo.
- Consolidated Cement Corp., Chicago
- Cowell P. C. Co., Cowell, Cal.
- Crescent P. C. Co., Wampum, Pa.
- Dewey P. C. Co., Kansas City, Mo.
- Diamond P. C. Co., Cleveland, Ohio
- Edison P. C. Co., New York
- Georgia Cement & Stone Co., Birmingham, Ala.
- Giant P. C. Co., Philadelphia
- Glen Falls P. C. Co., Glen Falls, N. Y.
- Golden State P. C. Co., Los Angeles, Cal.
- Great Western, P. C. Co., Kansas City, Mo.
- Hawkeye P. C. Co., Des Moines, Iowa
- Hercules Cement Corp., Philadelphia
- Hermitage P. C. Co., Nashville, Tenn.
- Huron P. C. Co., Detroit, Mich.
- International Cement Corp., New York
- International P. C. Co., Ltd., Spokane, Wash.
- Kosmos P. C. Co., Louisville, Ky.
- La Tolteca Compania de Cemento Portland, Mexico City, Mex.
- Lawrence Cement Co., New York
- Lehigh P. C. Co., Allentown, Pa.
- Louisville Cement Co., Louisville, Ky.
- Manitowoc P. C. Co., Manitowoc, Wis.
- Marlboro Cement Co., Edmonton, Can.
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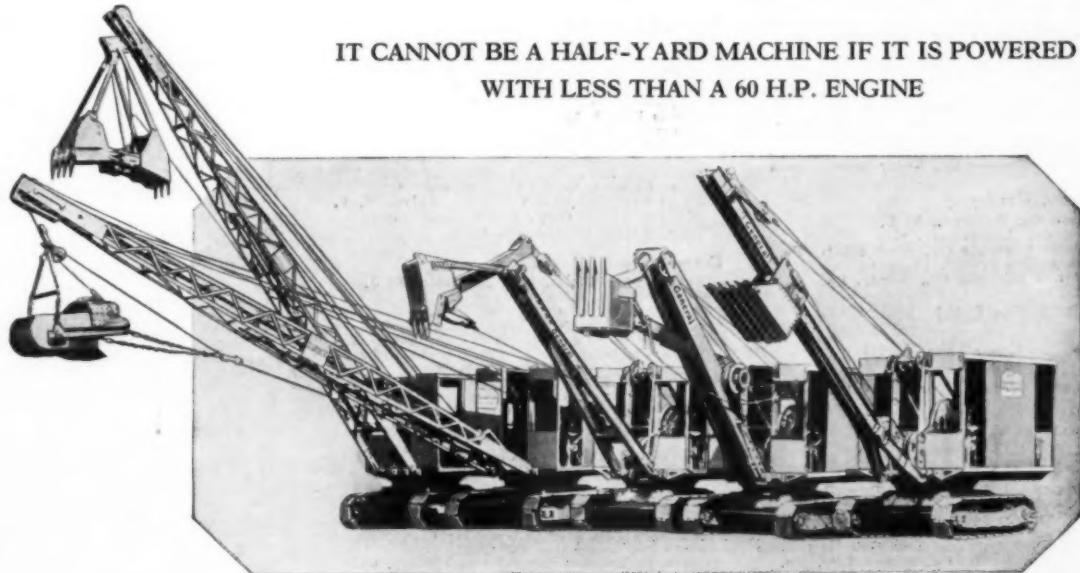
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- Williams Patent Crusher & Pulv. Co., St. Louis
- Wise Pulverizer Co., O. B., Knoxville, Tenn.

Crushing Plants, Portable

- *Austin-Western Road Machy. Co., Chicago
- *Day Pulverizer Co., Knoxville, Tenn.
- *Pioneer Gravel Equip. Mfg. Co., Minneapolis
- Acme Rd. Machy. Co., Frankfort, N. Y.
- Good Roads Machy. Co., Kennett Square, Pa.
- Diamond Iron Works, Minneapolis, Minn.
- Iowa Mfg. Co., Cedar Rapids, Iowa
- Smith Engg. Works, Milwaukee, Wis.
- Traylor Engg. & Mfg. Co., Allentown, Pa.
- Universal Road Machy. Co., Kingston, N. Y.
- Western Wheeled Scraper Co., Aurora, Ill.
- Williams Patent Crusher & Pulv. Co., St. Louis

Culvert Forms (See Forms)

Culverts, Cast Iron (See also Pipe, Cast Iron)

- *Burch Corp., The, Crestline, Ohio

- *U. S. Pipe & Fdy. Co., Burlington, N. J.

- American Casting Co., Birmingham, Ala.

- Beach Mfg. Co., Charlotte, Mich.

- Galion Iron Works & Mfg. Co., Galion, Ohio

Culverts, Corrugated Metal

- *Armeo Culvert Mfrs. Assn., Middletown, O.
- *Austin-Western Road Machy. Co., Chicago
- *Gohl Culv. Mfrs. Inc., Newport, Ky.
- American Casting Co., Birmingham, Ala.
- Bark Riv. Bridge & Culv. Co., Bark Riv, Mich.
- Beach Mfg. Co., Charlotte, Mich.
- Beatrice Steel Tank Mfg. Co., Beatrice, Neb.
- Berger Mfg. Co., Jacksonville, Fla.
- Burnham Mfg. Co., Woods Creek, Utah
- Calif. Corr. Culv. Co., W. Berkeley, Calif.
- Canada Ingot Co. Co., Ltd., Guelph, Ont.
- Canton Culv. Co., Canton, Ohio
- Denver Steel & Iron Wks., Denver, Colo.
- Dixie Culv. & Metal Co., Atlanta, Ga.
- Edwards Mfg. Co., Cincinnati, Ohio
- Galion Iron Wks. & Mfg. Co., Galion, Ohio
- Good Roads Machy. Co., Kennett Square, Pa.
- Hardesty Mfg. Co., R., Denver, Colo.
- Iowa Pure Ir. Co., Des Moines, Iowa
- Kentucky Culv. Mfg. Co., Louisville, Ky.
- Lyle Culv. & Pipe Co., Minneapolis
- Maryland Culv. & Metal Co., Baltimore, Md.
- Nebraska Culv. & Mfg. Co., Wahoo, Neb.
- N. E. Metal Culv. Co., Palmer, Mass.
- Newport Culv. Co., Newport, Ky.
- Northfield Iron Co., Northfield, Minn.
- Northwestern Sheet & Ir. Wks., Wahpeton, N. D.
- Ohio Corr. Culv. Co., Middlefield, Ohio
- O'Neal Co., W. Q., Crawfordsville, Ind.
- Penn Metal Co., Boston, Mass.
- Pure Iron Culv. & Mfg. Co., Portland, Ore.
- Road Supply & Metal Co., Topeka, Kan.
- St. Paul Corr. Co., St. Paul, Minn.
- Sioux Falls Metal Culv. Co., Sioux Falls, S. D.
- So. Metal Culv. Co., Salisbury, N. C.
- Spokane Culv. & Tank Co., Spokane, Wash.
- Tennessee Metal Culv. Co., Nashville, Tenn.
- Toncan Culv. Mfrs. Assn., Massillon, Ohio
- Union Iron Prod. Co., E., Chicago, Ill.
- Western Metal Mfg. Co., Houston, Tex.
- Wheeling Corr. Co., Wheeling, W. Va.

Curb and Gutter Forms (See Forms)

CONTRACTORS AND ENGINEERS MONTHLY



GOHI FABRICATORS

THE PENNSYLVANIA CULVERT CO., Philadelphia
 DENVER STEEL & IRON WORKS CO., Denver, Colo.
 A. N. EATON, METAL PRODUCTS, Omaha, Nebr.
 FEENAUGHTY MACHINERY CO., Portland, Oregon
 TENNISON BROTHERS, Texarkana, Ark.
 CAPITAL CITY CULVERT CO., Madison, Wis.
 CENTRAL CULVERT CO., Ottumwa, Iowa
 ROANOKE SALES CORP., Roanoke, Va.
 ST. PAUL CORRUGATING CO., St. Paul, Minn.
 TENNISON BROTHERS, Oklahoma City, Okla.
 A. N. EATON, METAL PRODUCTS, Billings, Mont.
 THE NEWPORT CULVERT CO., Newport, Ky.

THIS installation of a GOHI CORRUGATED CULVERT — 36" in diameter and 246' long — is on one of the new State Highways of Minnesota. The fill is nearly fifty feet in depth, demonstrating the tremendous *flexible strength* of the culvert. Flexibility prevents breakage from freezing water, settling fills, or pounding of heavy traffic. Made of 99.90% *Pure Iron-Copper Alloy*, GOHI CULVERTS resist the corrosive influences of soil, water and weather. Culverts installed more than 20 years ago show little or no deterioration. For full information, write to the nearest GOHI Fabricator.

GOHI CULVERT MANUFACTURERS, Inc.
 Newport, Kentucky



(Meet copper-bearing pure iron requirements in all accepted specifications for corrugated metal culverts.)

GOHI
 PRONOUNCED "GO-HIGH"
Corrugated
CULVERTS

- - - WHERE TO PURCHASE - - -

Curb Cocks (See Cocks)

Curb Guards, Steel (See Guards)

Curing Concrete, Asphalt for (See Asphalt)

Cutters, Bar (See Benders and Cutters)

Cutters, Brush

*LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa

Cutters, Pipe

*Bills & Ford Mfg. Co., Detroit, Mich.
Armstrong Mfg. Co., Detroit, Mich.
Barnes Tool Co., New Haven, Conn.
Borden Co., Warren, Ohio
Cook, Inc., A. D., Lawrenceburg, Ind.
Erie Tool Works, Erie, Pa.
Greenfield Tap & Die Corp., Greenfield, Mass.
Oswego Tool Co., Oswego, N. Y.
Reed Mfg. Co., Erie, Pa.
Smith Mfg. Co., A. P., East Orange, N. J.
Walworth Co., Boston, Mass.

Cutters, Rod and Wire

Carols Mfg. Co., Sterling, Ill.
Helwig Mfg. Co., St. Paul, Minn.
M. & M. Wire Clamp Co., Minneapolis, Minn.
Morse-Starratt Prod. Co., Oakland, Calif.

Cutting and Welding Apparatus (See Welding Apparatus)

Deep Well Pumps (See Pumps)

Derrick Fittings (See Fittings)

Derricks, Guy and Stiffleg

*Lidgerwood Mfg. Co., Elizabeth, N. J.
*McKiernan-Terry Corp., New York
*Saggen Derrick Co., Chicago
American Hoist & Derrick Co., St. Paul, Minn.
Clyde Iron Works Sales Co., Duluth, Minn.
Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
Flory Mfg. Co., Bangor, Pa.
Mundy Hoisting Eng. Co., J. S., Newark, N. J.
Street Bros. Mach. Wks., Chattanooga, Tenn.

Derricks, Pipe-Laying

*Saggen Derrick Co., Chicago
Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
Street Bros. Mach. Wks., Chattanooga, Tenn.
Taylor Port. Steel Der. Co., Chicago
W-K-M Co., Houston, Texas

Derricks, Revolving

Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
Lakeside Bridge & Steel Co., No. Milwaukee
Street Bros. Mach. Wks., Chattanooga, Tenn.

Derricks, Steel

*Hayward Co., New York
*Lidgerwood Mfg. Co., Elizabeth, N. J.
*McKiernan-Terry Corp., New York
*Saggen Derrick Co., Chicago
American Hoist & Der. Co., St. Paul, Minn.
Clyde Iron Works Sales Co., Duluth, Minn.
Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
Inaley Mfg. Co., Indianapolis, Ind.
Lakeside Bridge & Steel Co., No. Milwaukee
Street Bros. Mach. Wks., Chattanooga, Tenn.

Derricks, Steel, Portable

*Lidgerwood Mfg. Co., Elizabeth, N. J.
American Hoist & Der. Co., St. Paul, Minn.
Clyde Iron Works Sales Co., Duluth, Minn.
Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
Street Bros. Mach. Wks., Chattanooga, Tenn.
Taylor Port. Steel Derrick Co., Chicago

Diaphragm Pumps (See Pumps)

Diesel Engines (See Engines)

Diesel Shovels (See Shovels)

Diggers, Post Hole, Power (See Augers)

Dipper Dredges (See Dredges)

Distributing Plants, Concrete (See Concrete Placing Plants)

Distributors, Tar, Asphalt and Oil

*Austin-Western Road Machy. Co., Chicago
*Etnyre & Co., Inc., E. D., Oregon, Ill.
*Hyatt & Co., Inc., Chas., New York
Good Roads Machy. Co., Kennett Square, Pa.
Monhorst Co., Jos., Cincinnati, Ohio
Kinney Mfg. Co., Boston, Mass.

Macleod Co., Cincinnati, Ohio
Municipal Supply Co., South Bend, Ind.
Sacramento Engg. & Mach. Works, Sacramento, Calif.
Spears-Wells Machy. Co., Oakland, Calif.
Universal Rd. Machy. Co., Kingston, N. Y.

Ditchers (See Excavators, Trench; or Graders)

Drag Scrapers (See Scrapers)

Drag Shovels (See Shovels, Convertible)

Dragline Cableways (See Cableways)

Dragline Scrapers (See Scrapers)

Drags, Road

*Austin-Western Road Machy. Co., Chicago
*General Wheelbarrow Co., Cleveland, Ohio
Acme Road Machy. Co., Frankfort, N. Y.
Adams Co., J. D., Indianapolis, Ind.
American Steel Scraper Co., Sidney, Ohio
Beach Mach. Co., Charlotte, Mich.
Deere & Co., Moline, Ill.
Footh Bros. Gear & Machine Co., Chicago
Galion Iron Wks. & Mfg. Co., Galion, Ohio
Harris Co., B. W. & Leo, Minneapolis, Minn.
Miskin Scraper Works, Ucon, Idaho
Northfield Iron Co., Northfield, Minn.
Slusser McLean Scraper Co., Sidney, Ohio
Spears-Wells Machy. Co., Oakland, Calif.
Toledo Wheelbarrow Co., Toledo, Ohio
Universal Road Machy. Co., Kingston, N. Y.
Western Wheeled Scraper Co., Aurora, Ill.

Drainage Equipment, Special

Killefer Mfg. Co., Los Angeles, Calif.

Drainage Tile (See Tile)

Drawing Inks (See Inks)

Drawing Instruments and Supplies (See Instruments)

Dredges, Dipper

*Bay City Shovels, Inc., Bay City, Mich.
*Osgood Co., Marion, Ohio
American Steel Dredge Co., Ft. Wayne, Ind.
Bucyrus-Erie Co., So. Milwaukee, Wis.
Marion Steam Shovel Co., Marion, Ohio

Dredges, Hydraulic

American Steel Dredge Co., Fort Wayne, Ind.
Bucyrus-Erie Co., So. Milwaukee, Wis.
Elliott Mach. Corp., Baltimore, Md.
Morris Machine Works, Baldwinsville, N. Y.

Dredging Buckets (See Buckets)

Dredging Machinery (See also Pumps, Dredging)

*Lidgerwood Mfg. Co., Elizabeth, N. J.
*McKiernan-Terry Corp., New York
Bucyrus-Erie Co., So. Milwaukee, Wis.
Elliott Mach. Corp., Baltimore, Md.
Mundy Hoisting Eng. Co., J. S., Newark, N. J.
Street Bros. Mach. Wks., Chattanooga, Tenn.
Thomas Elevator Co., Chicago

Dredging Pumps (See Pumps)

Dressing, Belt

Dixon Crucible Co., Jos., Jersey City, N. J.
Hotaling Mfg. Co., Philadelphia
Stephenson Mfg. Co., Albany, N. Y.
Tropical Paint & Oil Co., Cleveland, Ohio
U. S. Rubber Co., New York

Drill Steel, Hollow (See Steel)

Drill Steel Sharpeners (See Sharpeners)

Drills, Blast Hole and Well

*Keystone Driller Co., Beaver Falls, Pa.
Armstrong Mfg. Co., Waterloo, Iowa
Loomis Machine Co., Tiffin, Ohio
Sanderson Cyclone Drill Co., Orrville, Ohio
Star Drilling Machine Co., Akron, Ohio

Drills, Core

*McKiernan-Terry Corp., New York
Ingersoll-Rand Co., New York
Loomis Machine Co., Tiffin, Ohio
Mott Core Drilling Co., Huntington, W. Va.
Sprague & Henwood Inc., Scranton, Pa.
Sullivan Machinery Co., Chicago

Drills, Electric

*Independent Pneu. Tool Co., Chicago
Black & Decker Mfg. Co., Towson, Md.
Chicago Pneumatic Tool Co., New York
Cincinnati Electric Tool Co., Cincinnati, Ohio
Portable Power Tool Corp., Warsaw, Ind.
Ryerson & Son, Jos. T., Chicago

Speedway Mfg. Co., Cicero, Ill.
Syntron Co., Pittsburgh, Pa.

U. S. Electrical Tool Co., The, Cincinnati
Van Dorn Elec. Tool Co., Towson, Md.
Wappat, Inc., Pittsburgh, Pa.
Wodack Elec. Tool Corp., Chicago

Drills, Rock, Pneumatic

*Hardsoc Wonder Drill Co., Ottumwa, Ia.
*Independent Pneu. Tool Co., Chicago
Buhl Co., The, Chicago
Chicago Pneu. Tool Co., New York
Cleveland Pneu. Tool Co., Cleveland
Dallett Co., Philadelphia, Pa.
Gardner-Denver Co., Quincy, Ill.
Gilmor Mfg. Co., E. Boston, Mass.
Helwig Mfg. Co., St. Paul, Minn.
Ingersoll-Rand Co., New York
Keller, Inc., W. H., Grand Haven, Mich.
Loomis Machine Co., Tiffin, Ohio
Sullivan Machinery Co., Chicago
Wood Drill Works, Paterson, N. J.

Drivers, Pile (See Hammers)

Dryers, Sand and Gravel

*Chausse Oil Burner Co., Elkhart, Ind.
Honhorst Co., Jos., Cincinnati, Ohio
*Littleford Bros., Cincinnati, Ohio
Aeroil Burner Co., West New York, N. J.
Bartlett & Snow Co., C. O., Cleveland, Ohio
MacLeod Co., Cincinnati, Ohio
Merriman Asphalt Plant, Inc., Lima, Ohio

Dump Bodies (See Bodies)

Dump Wagons (See Wagons)

Dynamite

Atlas Powder Co., Wilmington, Del.
Austin Powder Co., Cleveland, Ohio
Egyptian Powder Co., East Alton, Ill.
du Pont de Nemours & Co., E. L., Wilmington, Del.

Equitable Powder Mfg. Co., East Alton, Ill.
Giant Powder Co., San Francisco, Calif.
Hercules Powder Co., Wilmington, Del.
Illinois Powder Mfg. Co., St. Louis, Mo.
King Powder Co., Cincinnati, Ohio

Electric Cable (See Wire and Cable, Electric)

Electric Drills (See Drills)

Electric Hoists (See Hoists)

Electric Lighting Plants

*Allis-Chalmers Mfg. Co., Milwaukee, Wis.
*Homelite Corp., Port Chester, N. Y.
*Novo Engine Co., Lansing, Mich.
Climax Engg. Co., Clinton, Iowa
Cook Motor Co., Delaware, Ohio
Cushman Motor Works, Lincoln, Neb.
Fairbanks, Morse & Co., Chicago
Fuller & Johnson Mfg. Co., Madison, Wis.
General Electric Co., Schenectady, N. Y.
Kohler Co., Kohler, Wis.
Onan & Sons, D. W., Minneapolis, Minn.
Sullivan Machinery Co., Chicago
Sunbeam Elec. Mfg. Co., Evansville, Ind.
Syntron Co., Pittsburgh, Pa.
United States Motors Corp., Oshkosh, Wis.
Westinghouse E. & M. Co., E. Pittsburgh

Electric Planes (See Planes)

Electric Shovels (See Shovels)

Electric Transformers (See Transformers)

Electric Welding Apparatus (See Welding Apparatus)

Elevators, Bucket

*Allis-Chalmers Mfg. Co., Milwaukee, Wis.
*Austin-Western Rd. Machy. Co., Chicago
*Diamond Iron Works, Minneapolis, Minn.
*Pioneer Gravel Equip. Mfg. Co., Minneapolis
Chain Belt Co., Milwaukee, Wis.
Chicago Automatic Conv. Co., Cicero, Ill.
Fairfield Engg. Co., Marion, Ohio
Good Roads Machy. Co., Kennett Square, Pa.
Haiss Mfg. Co., Geo., New York
Iowa Mfg. Co., Cedar Rapids, Iowa
Jeffrey Mfg. Co., Columbus, Ohio
Link-Belt Co., Chicago
Logan Co., Louisville, Ky.
New England Rd. Machy. Co., South Boston
New Holland Mach. Co., New Holland, Mich.
Rogers Iron Works Co., Joplin, Mo.
Smith Engg. Works, Milwaukee, Wis.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Traylor Engg. & Mfg. Co., Allentown, Pa.
Universal Road Machy. Co., Kingston, N. Y.
Webster & Weller Mfg. Co.'s, Chicago
Western Wheeled Scraper Co., Aurora, Ill.

* Indicates that the manufacturer carries an advertisement. See index facing inside back cover *

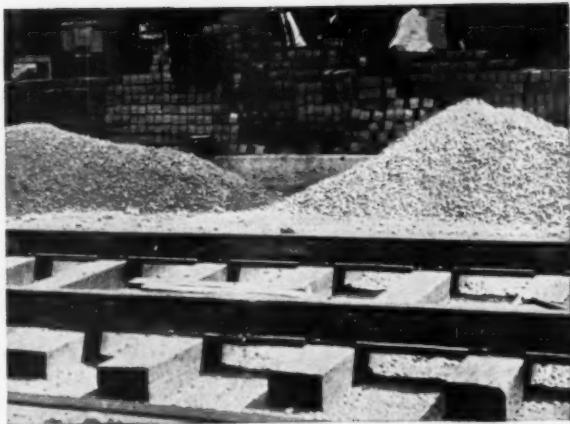
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540



MECHANICAL TIE or



WOOD TIE

Carey
Elastite
RAIL FILLER

Protects Paving next to Tracks

The deterioration of paving next to tracks is primarily caused by rail vibration. Carey Elastite Rail Filler, placed in the web of the rail as shown by the above photographs, provides a resilient cushion against vibration which would otherwise be transmitted to the adjacent paving. Paving "kick-ups" are thus prevented, with a consequent reduction of paving maintenance expense.

Elastite Rail Filler is an asphalt compound reinforced with tough fibres. Resistant to moisture and unaffected by climatic extremes of temperature, it requires no attention after its installation. The labor cost of its application is reduced to the minimum because the material is preformed to fit any type rail.

The value of Carey Elastite Rail Filler has been proven by installations in every part of the United States. We will gladly supply samples, prices and full information on request.

THE PHILIP CAREY COMPANY -:- Lockland, Cincinnati, Ohio

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Carey
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HEAT INSULATIONS
ASBESTOS MATERIALS
CAREYSTONE CORRUGATED SIDING
ASFALTSLATE SHINGLES
BUILDING PAPERS

- - - WHERE TO PURCHASE - - -

Elevators, Material

*Jaeger Machine Co., Columbus, Ohio
*Lakewood Engg. Co., Columbus, Ohio
*Saager Derrick Co., Chicago
Chain Bolt Co., Milwaukee, Wis.
G. H. & E. Mfg. Co., Milwaukee, Wis.
Clyde Iron Wks. Sales Co., Duluth, Minn.
Insley Mfg. Co., Indianapolis, Ind.
O. K. Clutch & Machy. Co., Columbia, Pa.
Thomas Elevator Co., Chicago

Embankment Rollers (See Rollers)

Emulsified Asphalt (See Asphalt, Emulsified)

Engineers, Consulting and Inspection (See Directory in this issue)

Engines, Diesel

*Allis-Chalmers Mfg. Co., Milwaukee, Wis.
*Worthington Pump & Machy. Corp., Harrison, N. J.
Anderson Eng. & Fdy. Co., Anderson, Ind.
Atlas Imperial Diesel Eng. Co., Oakland, Calif.
Bethlehem Steel Co., Bethlehem, Pa.
Buckeye Machy. Co., Lima, Ohio
Buda Co., Harvey, Ill.
Busch-Sulzer Bros. Diesel Eng. Co., St. Louis
Charter Gas Eng. Co., Sterling, Ill.
Chicago Pneu. Tool Co., New York
Cooper-Bessemer Corp., Mt. Vernon, Ohio
Cummins Engine Co., Columbus, Indiana
Fairbanks, Morse & Co., Chicago
Fulton Iron Works Co., St. Louis, Mo.
Ingersoll-Rand Co., New York
Johnson Mfg. Co., Seattle, Wash.
Lombard Governor Co., Ashland, Mass.
McIntosh & Seymour Corp., Auburn, N. Y.
Morris & DeLvergne, Inc., I. P., Philadelphia
Muncie Oil Engine Co., Muncie, Ind.
New London Ship & Eng. Co., Groton, Ct.
Nordberg Mfg. Co., Milwaukee, Wis.
Power Mfg. Co., Marion, Ohio
St. Mary's Oil Eng. Co., St. Charles, Mo.
Stover Mfg. & Eng. Co., Freeport, Ill.
Waukesha Motor Co., Waukesha, Wis.
Young Radiator Co., Racine, Wis.

Engines, Gasoline

*Allis-Chalmers Mfg. Co., Milwaukee, Wis.
*Caterpillar Tractor Co., Peoria, Ill.
*Continental Motors Corp., Muskegon, Mich.
*Domestic Eng. & Pump Co., Shippensburg, Pa.
*Hercules Motors Corp., Canton, Ohio
*International Harvester Co., Chicago
*Lanz Corp., New Holstein, Wis.
*LeRoi Co., Milwaukee, Wis.
*New Engine Co., Lansing, Mich.
Antecar Co., Ardmore, Pa.
Beaver Mfg. Co., Milwaukee, Wis.
Buda Co., Harvey, Ill.
Charter Gas Eng. Co., Harvey, Ill.
Climax Engg. Co., Clinton, Iowa
Cushman Motor Works, Lincoln, Neb.
Electric Wheel Co., Quincy, Ill.
Evinrude Div., Outboard Motors Corp., Milwaukee
Foos Gas Engine Co., Springfield, Ohio
Fuller & Johnson Mfg. Co., Madison, Wis.
Hercules Products, Inc., Evansville, Ind.
Indian Motorcycles Co., Springfield, Mass.
Ingersoll-Rand Co., New York
Sterling Engine Co., Buffalo, N. Y.
Stover Mfg. & Eng. Co., Freeport, Ill.
Universal Motor Co., Oakwood, Wis.
Universal Road Machy. Co., Kingston, N. Y.
Waukesha Motor Co., Waukesha, Wis.
Wisconsin Motor Co., Milwaukee, Wis.
Witte Engine Works, Kansas City, Mo.

Engines, Hoisting (See Hoists)

Engines, Kerosene

*Hercules Motors Corp., Canton, Ohio
Climax Engg. Co., Clintonville, Wis.
Electric Wheel Co., Quincy, Ill.
Fuller & Johnson Mfg. Co., Madison, Wis.
Hercules Products, Inc., Evansville, Ind.
Stover Mfg. & Eng. Co., Freeport, Ill.
Witte Engine Works, Kansas City, Mo.

Excavators, Bucket-Loading

Haas Mfg. Co., Geo., New York
New England Rd. Machy. Co., S. Boston, Mass.
Spears-Wells Machy. Co., Oakland, Calif.

Excavators, Dragline

*Bay City Shovels, Inc., Bay City, Mich.
*General Excavator Co., Marion, Ohio
*Ongood Co., Marion, Ohio
American Hoist & Derrick Co., St. Paul
Buckeye Traction Ditcher Co., Findlay, O.
Bucyrus-Erie Co., So. Milwaukee, Wis.

Bucyrus-Monighan Co., Chicago
Byers Machine Co., Ravenna, Ohio
Harnischfeger Corp., Milwaukee, Wis.
Industrial Brownhoist Corp., Cleveland, O.
Inasley Mfg. Co., Indianapolis, Ind.
Koehring Co., Milwaukee, Wis.
Manitowoc Engg. Wks., Manitowoc, Wis.
Marion Steam Shovel Co., Marion, Ohio
Mead-Morrison Mfg. Co., Boston, Mass.
Northwest Engg. Co., Chicago
Ohio Power Shovel Co., Lima, Ohio
Orton Crane & Shovel Co., Chicago
Page Engg. Co., Chicago
Speeder Machy. Corp., Cedar Rapids, Iowa
Star Drilling Machine Co., Akron, Ohio
The Shovel Co., Lorain, Ohio

Excavators, Trench, Bucket and Wheel-Type

*Shun Mfg. Co., Bucyrus, Ohio
Austin Machinery Corp., Muskegon, Mich.
Barber-Green Co., Aurora, Ill.
Buckeye Traction Ditcher Co., Findlay, O.
C. H. & E. Mfg. Co., Milwaukee, Wis.
Cleveland Trencher Co., Cleveland, Ohio
Industrial Brownhoist Corp., Cleveland, O.
Parsons Co., Newton, Iowa
Ruth Dredger Mfg. Corp., Ltd., Los Angeles, Calif.

Expansion Joint Material, Paving

*Carey Co., Phillip, Cincinnati, Ohio
*Servicized Products Corp., Chicago
*Standard Oil Co. of Ind., Chicago
*Truscon Steel Co., Youngstown, Ohio
Johns-Manville Corp., New York
Kalmus Steel Co., Chicago
Meadows, Inc., W. R., Elgin, Ill.
Ohio Fibrated Asph. & Rubber Co., Chicago
St. Paul Corrugating Co., St. Paul, Minn.
Western Elaterite Roofing Co., Denver, Colo.

Explosives (See Dynamite or Powder, Black)

Explosives Storage (See Magazines)

Fabric Reinforcing for Concrete (See Wire Fabric Reinforcing)

Fence, Snow

Good Roads Machy. Co., Kennett Square, Pa.
Illinois Wire & Mfg. Co., Joliet, Ill.
New Jersey Fence Co., Burlington, N. J.
Northfield Iron Co., Northfield, Minn.
Rowe Mfg. Co., Galesburg, Ill.
Wickwire-Spencer Steel Co., New York

Fence, Wire and Iron

*American Steel & Wire Co., Chicago
American Fence Const. Co., New York
American Wire Fence Co., Chicago
Anchor Post Fence Co., New York
Bethlehem Steel Co., Bethlehem, Pa.
Chain Link Fence Co., Chicago
Continental Steel Corp., Kokomo, Ind.
Cyclone Fence Co., Waukegan, Ill.
Edwards Mfg. Co., Cincinnati, Ohio
Giant Mfg. Co., Council Bluffs, Iowa
Indian Steel & Wire Co., Muncie, Ind.
Interlocking Fence Co., Morton, Ill.
Keystone Steel & Wire Co., Peoria, Ill.
Page Fence Assn., Chicago
Page Steel & Wire Co., Bridgeport, Conn.
Pittsburgh Steel Co., Pittsburgh, Pa.
Stewart Iron Works Co., Cincinnati, Ohio
Van Dorn Iron Works, Cleveland, Ohio
Wayne Iron Works, Wayne, Pa.
Wickwire-Spencer Steel Co., New York

Finishers, Asphalt Road

*Blaw-Knox Co., Pittsburgh, Pa.
*Lakewood Engg. Co., Cleveland, Ohio

Finishers, Concrete Road

*Blaw-Knox Co., Pittsburgh, Pa.
*Heltzel Steel Form & Iron Co., Warren, O.
*Lakewood Engg. Co., Cleveland, Ohio

Finishing Machines, Shoulder

*Moritz-Bennett Corp., Eflingham, Ill.
Insley Mfg. Co., Indianapolis, Ind.

Fittings, Derrick

*Hayward Co., New York
*Lidgerwood Mfg. Co., Elizabeth, N. J.
*Saager Derrick Co., Chicago
American Hoist & Der. Co., St. Paul, Minn.
Dobie Fdy. & Mach. Co., Niagara Falls, N. Y.
Flory Mfg. Co., S. Bangor, Pa.
Mundy Hoisting Eng. Co., J. S. Newark, N. J.
Street Bros. Mach. Wks., Chattanooga, Tenn.

Fittings, Pipe

*Littlesford Bros., Cincinnati, Ohio
*U. S. Pipe & Fdy. Co., Burlington, N. J.
American Cast Iron Pipe Co., Birmingham, Ala.
Builders Iron Fdy., Providence, R. I.
Central Foundry Co., New York
Clow & Sons, J. B., Chicago
Crane Co., Chicago
Donaldson Iron Co., Emmaus, Pa.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, Ohio
Nat'l. O. I. Pipe Co., Birmingham, Ala.
Reading Steel Cast. Co., Inc., Bridgeport, O.
Walworth Co., Boston, Mass.
Warren Fdy. & Pipe Co., New York
Westinghouse E. & M. Co., E. Pittsburgh, Pa.
Wood & Co., R. D., Philadelphia

Fittings, Wire Rope

*American Steel & Wire Co., Chicago
*Williamsport Wire Rope Co., Williamsport, Pa.
Broderick & Bascom Rope Co., St. Louis
Dobie Fdy. & Mach. Co., Niagara Falls, N. Y.
Green, L. P., Chicago
Lechen & Sons Rope Co., A., St. Louis
Roebling's Sons Co., John A., Trenton, N. J.
Upson-Walton Co., Cleveland, Ohio
Wilcox-Crittenden Co., Inc., Middletown, O.

Floodlights, Acetylene, Portable

*National Carbide Sales Co., New York
MacLeod Co., Cincinnati, Ohio
Milburn Co., Alexander, Baltimore, Md.
Oxweld Acetylene Co., New York

Floodlights, Electric, Portable

*Homelite Corp., Port Chester, N. Y.
Crouse-Hinds Co., Syracuse, N. Y.
General Electric Co., Schenectady, N. Y.
Kohler Co., Kohler, Wis.

Floodlights, Stationary

B.T. Corp., Philadelphia
Crouse-Hinds Co., Syracuse, N. Y.
General Electric Co., Schenectady, N. Y.
Giant Mfg. Co., Council Bluffs, Iowa
Westinghouse E. & M. Co., E. Pittsburgh, Pa.

Flooring, Bridge, Asphalt

*Servicized Products Corp., Chicago
Flintkote Co., The, Boston, Mass.
Headley Emulsified Prod. Co., Philadelphia
Johns-Manville Co., New York
Meadows, Inc., W. R., Elgin, Ill.

Floorings, Asphaltic Cement

*Union Products Co., The, Cleveland, O.

Forges, Oil

Hauke Mfg. Co., Brooklyn, N. Y.

Form Clamps and Ties (See Clamps and Tie Form)

Forms, Concrete Culvert

*Blaw-Knox Co., Pittsburgh, Pa.
Concrete Form Co., Inc., Syracuse, N. Y.
Northfield Iron Co., Northfield, Minn.

Forms, Concrete Manhole

*Blaw-Knox Co., Pittsburgh, Pa.
*Heltzel Steel Form & Iron Co., Warren, O.
Hotchkiss Steel Prod. Co., Binghamton, N. Y.
Metal Forms Corp., Milwaukee, Wis.

Forms, Concrete Pipe

*Blaw-Knox Co., Pittsburgh, Pa.
*Heltzel Steel Form & Iron Co., Warren, O.
Climax Machy. Co., Indianapolis, Ind.
Marion Iron Works, Los Angeles, Calif.
Quinn Wire & Iron Wks., Boone, Iowa
R. & L. Concrete Machy. Co., Kendallville, Ia.

Forms, Concrete Road

*Blaw-Knox Co., Pittsburgh, Pa.
*Heltzel Steel Form & Iron Co., Warren, O.
*Lakewood Engg. Co., Columbus, Ohio
*Truscon Steel Co., Youngstown, Ohio
Harm Co., George O., Warren, Ohio
Hotchkiss Steel Prod. Co., Binghamton, N. Y.
Metal Forms Corp., Milwaukee, Wis.

Forms, Curb and Gutter

*Blaw-Knox Co., Pittsburgh, Pa.
*Heltzel Steel Form & Iron Co., Warren, O.
*Littlesford Bros., Cincinnati, Ohio
*Truscon Steel Co., Youngstown, Ohio
Hotchkiss Steel Prod. Co., Binghamton, N. Y.
Metal Forms Corp., Milwaukee, Wis.

Forms, for Macadam

*Heltzel Steel Form & Iron Co., Warren, O.

Forms, Sidewalk

*Blaw-Knox Co., Pittsburgh, Pa.
*Heltzel Steel Form & Iron Co., Warren, O.
Hotchkiss Steel Prod. Co., Binghamton, N. Y.
Metal Forms Corp., Milwaukee, Wis.

MOST CONTRACTORS WOULD LIKE TO REDUCE DIRT MOVING COSTS AS MUCH AS 50%

They Can WITH A **BLAW-KNOX**
(ATECO) **HYDRAULIC SCRAPER**



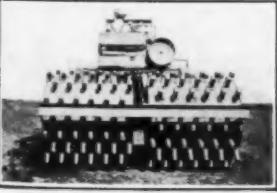
WAGON GRADER



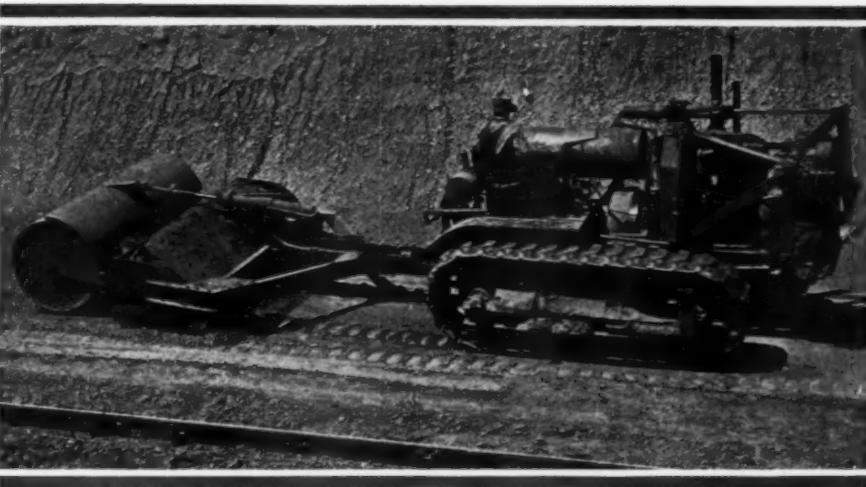
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TAMPING ROLLER



How's that for economy?

Hitched to a tractor . . . the Blaw-Knox HYDRAULIC SCRAPER moves heaping loads, grades, excavates, fills and compacts. Contractors who are using it are constantly adapting it to new cost-reducing stunts.

The HYDRAULIC SCRAPER fits in on all scraper operations . . . it takes care of those bothersome jobs like fine grading, or close cutting, or spreading the load over the edge of a fill . . . and it can be used as a Bulldozer.

The all-around *utility* of the HYDRAULIC SCRAPER has been proved on hundreds of jobs.

Blaw-Knox will show you how to *slice* your dirt moving and grading costs.

Fill in and mail this coupon.

BLAW-KNOX COMPANY, 2067 Farmers Bank Building
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Send me complete information about the Blaw-Knox
Dirtmover and the complete line of Blaw-Knox (Ateco)
Dirt Moving Equipment.

Name _____
Company _____
Street _____
City _____ State _____

BLAW-KNOX



* * * * * WHERE TO PURCHASE * * * * *

Fresnos (See Scrapers, Rotary)

Furnaces, Lead Melting

*Chausse Oil Burner Co., Elkhart, Ind.
*Littleford Bros., Cincinnati, Ohio
Aeroil Burner Co., West New York, N. J.
Chicago Flexible Shaft Co., Chicago
Hauck Mfg. Co., Brooklyn, N. Y.
Macleod Co., Cincinnati, Ohio
Smith Mfg. Co., A. P., East Orange, N. J.
Stuebner Iron Works, Inc., G. L., Long Island City, N. Y.

Gasoline Engines (See Engines)

Gasoline Hoists (See Hoists)

Gasoline Shovels (See Shovels)

Gasoline Storage Tanks (See Tanks)

Gates, Bin

*Austin-Western Rd. Machinery Co., Chicago
*Butler Bin Co., Waukesha, Wis.
*Heitzel Steel Form & Iron Co., Warren, Ohio
*Indaly Mfg. Co., Indianapolis, Ind.
*Lakewood Engg. Co., Columbus, Ohio
*Ransome Conc. Machy. Co., Dunellen, N. J.
Beaumont Co., R. H., Philadelphia
Chain Belt Co., Milwaukee, Wis.
Good Roads Machy. Co., Kennett Square, Pa.
Hains Mfg. Co., Geo., New York
Neff & Fry Co., Camden, Ohio
New Holland Machine Co., New Holland, Pa.
Robins Conv. Belt Co., New York
Smith Engg. Works, Milwaukee, Wis.
Traylor Engg. & Mfg. Co., Allentown, Pa.
Universal Road Machy. Co., Kingston, N. Y.
Webster & Weller Mfg. Co's., Chicago

Generators (See Motors and Generators)

Giants, Hydraulic

Abendroth & Root Mfg. Co., New York
Hendy Iron Works, Joshua, San Francisco
Johnson Mfg. Co., Seattle, Wash.

Grader Blades (See Blades)

Graders, Road

*Austin-Western Rd. Machy. Co., Chicago
*Blaw-Knox Co., Pittsburgh, Pa.
*Caterpillar Tractor Co., Peoria, Ill.
Acme Road Machy. Co., Frankfort, N. Y.
Adams Co., J. D., Indianapolis, Ind.
Baker Mfg. Co., Springfield, Ill.
Beach Mfg. Co., Charlotte, Mich.
Foots Bros. Gear & Machine Co., Chicago
Galion Iron Wks. & Mfg. Co., Galion, O.
Gilbert Mfg. Co., Stillwater, Minn.
Monroe & Sons, N. S., Arthur, Ill.
Northfield Iron Co., Northfield, Minn.
Ryan Mfg. Co., Chicago
Spears-Wells Machy. Co., Oakland, Calif.
Stroud Rd. Machy. Co., Omaha, Neb.
Western Wheeled Scraper Co., Aurora, Ill.
Wood & Co., L. C., Alden, Iowa

Graders, Road, Power

*Caterpillar Tractor Co., Peoria, Ill.
*Eddell Co., W. A., Bucyrus, Ohio
Adams Co., J. D., Indianapolis, Ind.
Beach Mfg. Co., Charlotte, Mich.
Galion Iron Wks. & Mfg. Co., Galion, Ohio
Good Roads Machy. Co., Kennett Square, Pa.
Home Mfg. Co., Rome, N. Y.
Spears-Wells Machy. Co., Oakland, Calif.
Wehr Co., Cudahy, Wis.
Western Wheeled Scraper Co., Aurora, Ill.

Graders, Road, Trench, Form

Carr & Co., Ted, Chicago

Granite Block Paving (See Block Paving)

Grating, Steel

*Blaw-Knox Co., Pittsburgh, Pa.
Hendrick Mfg. Co., Carbondale, Pa.

Gravel Dryers (See Dryers)

Gravel Washers (See Washers)

Gravity Conveyors (See Conveyors)

Grease (See Lubricants)

Grizzlies (See also Crushers, Rock)

*Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bartlett & Snow Co., C. O., Cleveland, O.
Link-Belt Co., Chicago
Robins Conv. Belt Co., New York
Rogers Iron Wks. Co., Joplin, Mo.
Smith Engg. Works, Milwaukee, Wis.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Traylor Engg. & Mfg. Co., Allentown, Pa.
Webster & Weller Mfg. Co's., Chicago

Grouting Machines

*Ransome Conc. Machy. Co., Dunellen, N. J.

Guard Rail, Highway

*American Steel & Wire Co., Chicago
*Truscon Steel Co., Youngstown, Ohio
American Wire Fence Co., Chicago
Anchor Post Fence Co., New York
Chain Belt Co., Milwaukee, Wis.
Chain Link Fence Co., Chicago
Cyclone Fence Co., Waukegan, Ill.
Hazard Wire Rope Co., Wilkes-Barre, Pa.
Page Steel & Wire Co., Bridgeport, Conn.
Stewart Iron Works Co., Cincinnati, Ohio
Upson-Walton Co., Cleveland, Ohio
Wickwire-Spencer Steel Co., New York

Guards, Paving, Steel

Godwin Co., W. S., Baltimore, Md.

Guards, Steel, for Curbs

*Truscon Steel Co., Youngstown, Ohio
Concrete Steel Co., New York
Godwin Co., W. S., Baltimore, Md.

Guy Derricks (See Derricks)

Hammers, Pile, Drop

Clyde Iron Wks. Sales Co., Duluth, Minn.
Dobie Fdy. & Mach. Co., Niagara Falls, N. Y.
Vulcan Iron Works, Chicago

Hammers, Sheeting, Hand, Power

*McKiernan-Terry Corp., New York
Chicago Pneumatic Tool Co., New York
Rodax Corp., Chicago
Union Iron Works, Hoboken, N. J.
Ingersoll-Rand Co., New York

Hammers, Sheeting and Pile, Power

*McKiernan-Terry Corp., New York
Union Iron Works, Hoboken, N. J.
Vulcan Iron Works, Chicago

Hand Brooms (See Brooms)

Hand Hoists (See Hoists)

Heaters, Surface, Asphalt

*Chausse Oil Burner Co., Elkhart, Ind.
*Littleford Bros., Cincinnati, Ohio
Aeroil Burner Co., West New York, N. J.
Barber Asphalt Co., Philadelphia
Equitable Asphalt Maint. Co., Kansas City, Mo.
Hauck Mfg. Co., Brooklyn, N. Y.
Macleod Co., Cincinnati, Ohio
Mohawk Asphalt Heater Co., Schenectady, N.Y.
Western Wheeled Scraper Co., Aurora, Ill.

Heaters, Tank Car

*Etnyre & Co., Inc., E. D., Oregon, Ill.
Cleaver & Co., Inc., J. C., Oregon, Ill.

Heating Kettles (See Kettles)

Heating Torches (See Torches)

Highway Guard Rail (See Guard-Rail)

Hitches, Tractor

*International Harvester Co., Chicago
Schaefer Co., Gustav, Cleveland, Ohio
*Trackson Co., Milwaukee, Wis.
Davenport Mfg. Co., Los Angeles, Calif.
Deere & Co., Moline, Ill.
Eberhard Mfg. Co., Cleveland, Ohio
Trail-IT Co., St. Paul, Minn.
Troy Trailer & Wagon Co., Troy, Ohio
Western Wheeled Scraper Co., Aurora, Ill.
Whitehead & Kales Co., Detroit, Mich.

Hoist Buckets (See Buckets)

Hoists, Belt-Driven

*Davis, Inc., Norris K., San Francisco, Calif.
*Domestic Eng. & Pump Co., Shippensburg, Pa.
*Lidgerwood Mfg. Co., Elizabeth, N. J.
*Sterling Machy. Corp., Kansas City, Mo.
Acme Road Machy. Co., Frankfort, N. Y.
American Hoist & Derrick Co., St. Paul
Brown Clutch Co., Sandusky, Ohio
Clyde Iron Wks. Sales Co., Duluth, Minn.
Dobie Fdy. & Mach. Co., Niagara Falls, N. Y.
Flory Mfg. Co., S. Bangor, Pa.
Fridy Hoist & Machy. Co., Mountville, Pa.
Lansing Co., Lansing, Mich.
Mead-Morrison Mfg. Co., Boston, Mass.
Mundy Hoisting Eng. Co., J. S., Newark, N. J.
O. K. Clutch & Machy. Co., Columbia, Pa.
Orr & Sembower, Reading, Pa.
Street Bros. Mach. Works, Chattanooga, Tenn.
Universal Hoist & Mfg. Co., Cedar Falls, Ia.
Williams Hoist Co., Los Angeles, Calif.

Hoists, Concrete Tower and Material

*Davis, Inc., Norris K., San Francisco, Calif.
*Domestic Eng. & Pump Co., Shippensburg, Pa.
*Jaeger Machine Co., Columbus, Ohio
*Lidgerwood Mfg. Co., Elizabeth, N. J.
*McKiernan-Terry Corp., New York
*Nove Engine Co., Lansing, Mich.
*Sanger Derrick Co., Chicago, Ill.
*Sterling Machy. Corp., Kansas City, Mo.
American Hoist & Derrick Co., St. Paul
Beaumont Co., R. H., Philadelphia
Brown Clutch Co., Sandusky, Ohio
C. H. & E. Mfg. Co., Milwaukee, Wis.
Clyde Iron Wks. Sales Co., Duluth, Minn.
Dake Engine Co., Grand Haven, Mich.
Detroit Hoist & Mach. Co., Detroit, Mich.
Diamond Iron Works, Minneapolis, Minn.
Dobie Fdy. & Mach. Co., Niagara Falls, N. Y.
Elliot Mach. Corp., Baltimore, Md.
English Bros. Machy. Co., Kansas City, Mo.
Flory Mfg. Co., S. Bangor, Pa.
Fridy Hoist & Machy. Co., Mountville, Pa.
Gardner-Denver Co., Quincy, Ill.
Godfrey Conveyor Co., Elkhart, Ind.
Hains Mfg. Co., Geo., New York
Harnischfeger Corp., Milwaukee, Wis.
Industrial-Brownhoist Corp., Cleveland
Iowa Mfg. Co., Cedar Rapids, Iowa
Mead-Morrison Mfg. Co., Boston, Mass.
Mundy Hoisting Eng. Co., J. S., Newark, N. J.
Northern Engg. Works, Detroit, Mich.
Orr & Sembower, Reading, Pa.
Robbins & Myers Co., Springfield, O.
Rogers Iron Wks. Co., Joplin, Mo.
Shepard-Niles Crane & Hoist Corp., Montauk Falls, N. Y.
Street Bros. Mach. Works, Chattanooga, Tenn.
Thomas Elevator Co., Chicago
Treadwell Engg. Co., Easton, Pa.
Universal Hoist & Mfg. Co., Cedar Falls, Ia.
Vulcan Iron Works, Wilkes-Barre, Pa.
Williams Hoist Co., Los Angeles, Calif.

Hoists, Gasoline

*Construction Machy. Co., Waterloo, Ia.
*Davis, Inc., Norris K., San Francisco, Calif.
*Domestic Eng. & Pump Co., Shippensburg, Pa.
*Jaeger Machine Co., Columbus, Ohio
*Lidgerwood Mfg. Co., Elizabeth, N. J.
*McKiernan-Terry Corp., New York
*Nove Engine Co., Lansing, Mich.
*Sanger Derrick Co., Chicago, Ill.
*Sterling Machy. Corp., Kansas City, Mo.
American Cement Mach. Co., Inc., Keokuk, Ia.
American Hoist & Der. Co., St. Paul, Minn.
Beach Mfg. Co., Charlotte, Mich.
Brown Clutch Co., Sandusky, Ohio
C. H. & E. Mfg. Co., Milwaukee, Wis.
Clyde Iron Wks. Sales Co., Duluth, Minn.
Dake Engine Co., Grand Haven, Mich.
Diamond Iron Works, Minneapolis, Minn.
Ellicott Machine Corp., Baltimore, Md.
English Bros. Machy. Co., Kansas City, Mo.
Flory Mfg. Co., S. Bangor, Pa.
Fridy Hoist & Machy. Co., Mountville, Pa.
Iowa Mfg. Co., Cedar Rapids, Ia.
Joliet Mfg. Co., Joliet, Ill.
Lansing Co., Lansing, Mich.
Mead-Morrison Mfg. Co., Boston, Mass.
Mundy Hoisting Eng. Co., J. S., Newark, N. J.
O. K. Clutch & Machy. Co., Columbia, Pa.
Orr & Sembower, Reading, Pa.
Street Bros. Mach. Works, Chattanooga, Tenn.
Thomas Elevator Co., Chicago
Universal Hoist & Mfg. Co., Cedar Falls, Ia.
Willamette-Ersted Co., Portland, Ore.
Williams Hoist Co., Los Angeles, Calif.
Wyman, Robert, Billerica, Mass.

Hoists, Hand

*Beebe Bros., Inc., Seattle, Wash.
*Sanger Derrick Co., Chicago, Ill.
Clyde Iron Wks. Sales Co., Duluth, Minn.
Dobie Fdy. & Mach. Co., Niagara Falls, N. Y.
Stephens-Adamson Mfg. Co., Aurora, Ill.



Fast, powerful and sturdy Model 23 Hug Express Six. 2-ton capacity with 86 horsepower heavy duty engine and Auto-Lite electrical equipment.

Dependability Insurance for Hug Trucks

Hug Trucks are known throughout the country for their power and reliable performance. Available in models which range from light trucks to the heaviest types, they are used wherever reliable performance is of prime importance. The makers of Hug Trucks use Auto-Lite starting, lighting and ignition equipment to back up the dependability of their products.

The Electric Auto-Lite Company, Toledo, Ohio.

Auto-Lite

Starting. Lighting & Ignition

* * * * WHERE TO PURCHASE * * * *

Hoists, Motor Truck Body

- *St. Paul Hyd. Hoist & Mfg. Co., St. Paul, Minn.
- *Trackson Co., Milwaukee, Wis.
- *Wood Hyd. Hst. & Body Co., Detroit, Mich.
- Commercial Shearing & Stamping Co., Youngstown, O.
- Heil Co., Milwaukee, Wis.
- Hughes-Keenan Co., Mansfield, Ohio
- Perfection Steel Body Co., Galion, Ohio
- Superior Body Corp., Marion, Ind.
- Van Dorn Iron Works Co., Cleveland, Ohio

Hoists, Pneumatic

- *Independent Pneu. Tool Co., Chicago
- Chicago Pneu. Tool Co., New York
- Curtis Pneu. Machy. Co., St. Louis, Mo.
- Dake Engine Co., Grand Haven, Mich.
- Detroit Hoist & Mach. Co., Detroit, Mich.
- Gardner-Denver Co., Quincy, Ill.
- Hanna Engg. Works, Chicago
- Ingersoll-Rand Co., New York
- Northern Engg. Works, Detroit, Mich.
- Sullivan Machinery Co., Chicago

Hoists, Portable

- *Bebe Bros., Inc., Seattle, Wash.
- *Nove Engine Co., Lansing, Mich.
- *Sagam Derrick Co., Chicago
- *Sterling Machy. Corp., Kansas City, Mo.
- *Trackson Co., Milwaukee, Wis.
- American Hst. & Der. Co., St. Paul, Minn.
- Beckwith Machine Co., Ravenna, Ohio
- C. H. & E. Mfg. Co., Milwaukee, Wis.
- Clyde Iron Wks. Sales Co., Duluth, Minn.
- Fridy Hoist & Machy. Co., Mountville, Pa.
- Hendy Iron Works, Joshua, San Francisco
- Ingersoll-Rand Co., New York
- Joliet Mfg. Co., Joliet, Ill.
- Skagit Steel & Iron Works, Sedro Woolley, Wash.
- Street Bros. Mach. Works, Chattanooga, Tenn.
- Sullivan Machinery Co., Chicago
- Thomas Elevator Co., Chicago
- W.K.M. Co., Inc., Houston, Texas
- Wyman, Robert, Billerica, Mass.

Hoists, Steam

- *Lidgerwood Mfg. Co., Elizabeth, N. J.
- *McKinnon-Terry Corp., New York
- American Hoist & Der. Co., St. Paul, Minn.
- Clyde Iron Wks. Sales Co., Duluth, Minn.
- Dake Engine Co., Grand Haven, Mich.
- Dobbs Fdy. & Mach. Co., Niagara Falls, N. Y.
- Ellcott Mach. Corp., Baltimore, Md.
- Flory Mfg. Co., S. Bangor, Pa.
- Gardner-Denver Co., Quincy, Ill.
- Hains Mfg. Co., Gen., New York
- Hardie-Tynes Mfg. Co., Birmingham, Ala.
- Mead-Morrison Mfg. Co., Boston, Mass.
- Mundy Holisting Eng. Co., J. S., Newark, N. J.
- Orr & Sembayor, Eng. Co., Joplin, Mo.
- Rogers Iron Wks. Co., Joplin, Mo.
- Street Bros. Mach. Works, Chattanooga, Tenn.
- Thomas Elevator Co., Chicago
- Treadwell Engg. Co., Easton, Pa.

Hoists, Tractor-Mounted

- *Trackson Co., Milwaukee, Wis.
- Resistor Engg. Corp., Muskogee, Okla.
- Shaffer Specialty Co., Tulsa, Okla.
- Willamette-Ersted Co., Portland, Ore.

Hoses, Folding, Steel

- *Toledo Pressed Steel Co., Toledo, Ohio
- Beasley, J. P., Greenville, Texas

Hoses, Air

- *Continental Rubber Works, Erie, Pa.
- *Independent Pneu. Tool Co., Chicago
- *Schramm, Inc., West Chester, Pa.
- Boston Woven Hose & Rub. Co., Cambridge, Mass.
- Buhl Co., The, Chicago, Ill.
- Chicago Pneu. Tool Co., New York
- Cincinnati Rubber Mfg. Co., Cincinnati, O.
- Cleveland Rock Drill Co., Cleveland, Ohio
- Dallett Co., The, Philadelphia
- Gilman Mfg. Co., East Boston, Mass.
- Goodrich Rubber Co., B. F., Akron, O.
- Goodyear Tire & Rubber Co., Akron, Ohio
- Ingersoll-Rand Co., New York
- McConroy Co., Inc., Philadelphia
- Pennsylvania Flex. Met. Tubing Co., Phila.
- Republic Rubber Co., Youngstown, Ohio
- United States Rubber Co., New York

Hoses, Water

- *Continental Rubber Works, Erie, Pa.
- Cincinnati Rubber Mfg. Co., Cincinnati, O.
- Diamond Rubber Co., Inc., Akron, Ohio
- Fabric Fire Hose Co., New York
- Gardner-Denver Co., Quincy, Ill.
- Goodall Rubber Co., Philadelphia
- Goodrich Rubber Co., B. F., Akron, Ohio
- Goodyear Tire & Rubber Co., Akron, Ohio
- McConroy Co., Philadelphia
- New York Belting & Packing Co., New York
- U. S. Rubber Co., New York

Hose Couplings (See Couplings)

If you find any errors or omissions in this Where to Purchase list, please send corrections to CONTRACTORS AND ENGINEERS MONTHLY

Houses, Tool, Steel (See Buildings, Steel, Portable)

Hydraulic Dredges (See Dredges)

Hydraulic Giants (See Giants)

Hydraulic Rams (See Rams)

Ignition and Starting Systems

*Electric Auto-Lite Co., Toledo, Ohio

Industrial Railway Cars (See Cars)

Inks, Drawing

Carter's Ink Co., Boston, Mass.

Dietzgen Co., Eugene, Chicago

Higgins & Co., Chas. M., Brooklyn, N. Y.

Keuffel & Esser Co., Hoboken, N. J.

Pease Co., C. F., Chicago

Pelican Works, Gunther Wagner, New York

Weber Co., F., Philadelphia

Inspection Laboratories (See Directory in this issue)

Instruments and Supplies, Surveyors and Engineers

Ainsworth & Sons, Wm., Denver, Colo.

Beckman Co., L. Toledo, Ohio

Berger & Sons, C. L., Boston, Mass.

Brandis & Sons, Inc., Brooklyn, N. Y.

Bull & Bull Mfg. Co., Boston, Mass.

Dietzgen Co., Eugene, Chicago

Gurley, W. & L. E., Troy, N. Y.

Keuffel & Esser Co., Hoboken, N. J.

Kolesch & Co., New York

Leupold-Volpel & Co., Portland, Ore.

Lufkin Rule Co., Saginaw, Mich.

Starrett Co., L. S., Athol, Mass.

Warren-Knight Co., Philadelphia

Weber & Co., F., Philadelphia

White Co., David, Milwaukee, Wis.

Wood-Regan Inst. Co., South Orange, N. J.

Insulation, Pipe (See Covering)

Iron Fence (See Fence)

Iron Pipe (See Pipe)

Jacks, Lifting

Blackhawk Mfg. Co., Milwaukee, Wis.

Buda Co., Harvey, Ill.

Duff-Norton Mfg. Co., Pittsburgh, Pa.

Joyce-Cridland Co., Dayton, Ohio

Lovejoy Tool Works, Chicago

Oil Jack Co., Ampere, N. J.

Rees Mfg. Corp., Pittsburgh, Pa.

Templeton, Kenly & Co., Chicago

Verona Tool Works, Verona, Pa.

Watson-Stillman Co., New York

Jacks, Pipe-Forcing

Blackhawk Mfg. Co., Milwaukee, Wis.

Clark Co., H. W., Mattoon, Ill.

Duff-Norton Mfg. Co., Pittsburgh, Pa.

Joyce-Cridland Co., Dayton, Ohio

Easy Mfg. Co., Lincoln, Nebr.

Giant Mfg. Co., Council Bluffs, Ia.

Joyce-Cridland Co., Dayton, Ohio

Roper Corp., Geo. D., Rockford, Ill.

Templeton, Kenly & Co., Chicago

Jacks, Puller

*Moritz-Bennett Corp., Effingham, Ill.

Duff-Norton Mfg. Co., Pittsburgh, Pa.

Edelblute Co., T. H., Pittsburgh, Pa.

Joyce-Cridland Co., Dayton, Ohio

Puljack Mfg. Co., New York

Templeton, Kenly & Co., Chicago

Watson-Stillman Co., New York

Joint Compounds, Sewer (See Compounds)

Joint Materials, Cast Iron Pipe

Atlas Mineral Products Co., Mertztown, Pa.

Hydraulic Development Co., Boston, Mass.

Leadits Co., The, Philadelphia

United Lead Co., New York

Joints, Pipe, Flexible

*U. S. Pipe & Fdy. Co., Burlington, N. J.

Coldwell-Wilcox Co., Newburgh, N. Y.

Dayton Pipe Coupling Co., Dayton, O.

Dresser Mfg. Co., S. R., Bradford, Pa.

National Lead Co., New York

Victaulic Co. of Amer., New York

Joints, Rail (See Rail and Rail Joints)

Kerosene Engines (See Engines)

Kettles, Asphalt and Tar Heating

*Chausse Oil Burner Co., Elkhart, Ind.

*Connery & Co., Inc., Philadelphia

*Honhorst Co., Jos., Cincinnati, Ohio

*Hvass & Co., Inc., Chas., New York

*Littleford Bros., Cincinnati, Ohio

Acme Road Machy. Co., Frankfort, N. Y.

Aeroil Burner Co., West New York, N. Y.

American Steel Works, Kansas City, Mo.

Barber Asphalt Co., Philadelphia

Beach Mfg. Co., Charlotte, Mich.

Charleroi Iron Works, Charleroi, Pa.

Cammer & Son Co., F. D., Cleveland, O.

Hauck Mfg. Co., Brooklyn, N. Y.

Kinney Mfg. Co., Boston, Mass.

Lancaster Iron Works, Inc., Lancaster, Pa.

Macleod Co., Cincinnati, Ohio

Merriman Asphalt Plant, Inc., Lima, Ohio

Mohawk Asph. Heater Co., Schenectady, N. Y.

Spears-Well Mfg. Co., Oakland, Calif.

Stuebner Iron Wks., Inc., G. L., Long Island

City, N. Y.

Tarrant Mfg. Co., Saratoga Springs, N. Y.

Universal Road Machy. Co., Kingston, N. Y.

Laboratories, Inspection and Testing (See Directory in this issue)

Lanterns, Contractors'

*Dietz Co., E. New York

*National Carbide Sales Corp., New York

Defiance Lantern & Stamping Co., Rochester, N. Y.

Economy Electric Lantern Co., Chicago

Handian Buck Mfg. Co., St. Louis

National Carbon Co., Inc., New York

Star Headlight & Lantern Co., Rochester, N. Y.

Lead Pipe (See Pipe)

Lettering Guides

Weber Co., F., Philadelphia, Pa.

Wood-Regan Inst. Co., South Orange, N. J.

Lighting Plants, Electric (See Electric Lighting Plants)

Lights, Acetylene (See Floodlights)

Lights, Warning (See Lanterns, Contractors, or Torches, Warning)

Liquid Chlorine (See Chlorine)

Loaders (See Excavators, or Conveyors)

Loaders, Bucket, Self-Feeding

Barber-Greene Co., Aurora, Ill.

Haisa Mfg. Co., Geo., New York

New England Road Machy. Co., S. Boston, Mass.

Spears-Well Mfg. Co., Oakland, Calif.

Locomotive Cranes (See Cranes)

Locomotives, Contractors'

Baldwin Loco. Wks., Philadelphia

Brookville Loco. Co., Brooklyn, Pa.

Davenport Loco. & Mfg. Co., Davenport, Ia.

Fate-Root-Heath Co., Plymouth, Ohio

Heisler Loco. Wks., Erie, Pa.

Ingersoll-Rand Co., New York

Lima Loco. Wks., Lima, Ohio

Mid-West Loco. Wks., Hamilton, Ohio

Milwaukee Loco. Mfg. Co., Milwaukee, Wis.

Porter Co., H. K., Pittsburgh, Pa.

Vulcan Iron Works, Wilkes-Barre, Pa.

Westinghouse E. & M. Co., E., Pittsburgh

Whitecomb Locomotive Co., Rochelle, Ill.

Lubricants

*D-A Lubricant Co., Indianapolis, Ind.

Atlantic Refining Co., Inc., Philadelphia

Chicago Pneu. Tool Co., New York

Dixon Crucible Co., Jos., Jersey City, N. J.

Texas Co., The, New York

Lubricators

Bassick Mfg. Co., The, Chicago

Carr Fastener Co., Cambridge, Mass.

Chicago Pneu. Tool Co., New York

Ingersoll-Rand Co., New York

McColl Radiator Mfg. Co., Detroit, Mich.

McCullough Mfg. Co., Minneapolis, Minn.

Macadam, Forms for (See Forms)

Machines (See Various Classifications)

Magazines, Storage, Explosives

*Littleford Bros., Cincinnati, Ohio

Atlas Powder Co., Wilmington, Del.

du Pont de Nemours & Co., E. I., Wilmington, Del.

Hercules Powder Co., Wilmington, Del.

New York Blasting Supply Co., New York

Magnets

Apollo Magneto Corp., Kingston, N. Y.

Eisemann Magneto Corp., New York

Splitdorf-Bethlehem Elec. Co., Newark, N. J.

United American Bosch Corp., Springfield, Mass.

POWER plus TRACTION



CONTRACTORS ask for "Caterpillars" because "Caterpillars" ask no favors. Through wet weather or hot — through mud or over grades—"Caterpillar" track-type Tractors keep the job hurrying on to a speedy and profitable conclusion.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

Track-type Tractors Combines Road Machinery

(There's a "Caterpillar" Dealer Near You)

Prices — f. o. b. Peoria, Illinois

TEN	\$1100	THIRTY	\$2375
FIFTEEN	\$1450	FIFTY	\$3675
TWENTY	\$1900	SIXTY	\$4175

CATERPILLAR
REG. U. S. PAT. OFF.
T R A C T O R

WHERE TO PURCHASE

Maintainers, Road
 *Caterpillar Tractor Co., Peoria, Ill.
 *Shunk Mfg. Co., Bucyrus, Ohio
 Adams Co., J. D., Indianapolis, Ind.
 Baker Mfg. Co., Springfield, Ill.
 Beach Mfg. Co., Charlotte, Mich.
 Foote Bros. Gear & Machine Co., Chicago
 Galion Iron Works & Mfg. Co., Galion, O.
 Gilbert Mfg. Co., Stillwater, Minn.
 Northfield Iron Co., Northfield, Minn.
 Owensboro Ditch & Grav. Co., Owensboro, Ky.
 Root Spring Scraper Co., Kalamazoo, Mich.
 Spears-Wells Machy. Co., Oakland, Calif.
 Western Wheeled Scraper Co., Aurora, Ill.
 Willett Mfg. Co., Grand Rapids, Mich.
 Wood & Co., L. C., Alden, Iowa
 York Modern Corp., Unadilla, N. Y.

Manganese Steel Products (See Steel Products)

Manhole Covers (See Castings)

Manila Rope (See Rope)

Material Elevators (See Elevators)

Material Hoists (See Hoists)

Melting Furnaces (See Furnaces)

Mixer Bodies, Concrete (See Bodies)

Mixers, Concrete
 *Construction Machy. Co., Waterloo, Ia.
 *Davis, Inc., Norris K., San Francisco, Calif.
 *Jaeger Machine Co., Columbus, Ohio
 *Lakewood Engg. Co., Columbus, Ohio
 *Ransome Conc. Machy. Co., Dunellen, N. J.
 Acme Road Machy. Co., Frankfort, N. Y.
 American Cement Mach. Co. Inc., Keokuk, Ia.
 Anchor Mfg. Co., Chicago
 Archer Iron Works, Chicago
 Atlas Engg. Co., Clintonville, Wis.
 Beach Mfg. Co., Charlotte, Mich.
 Blystone Mfg. Co., Cambridge Springs, Pa.
 Chain Belt Co., Milwaukee, Wis.
 Foote Fdy. Co., J. B., Fredericktown, Ohio
 Gilson Bros. Co., Fredonia, Wis.
 Gray Iron Foundry Co., Reading, Pa.
 Knickerbocker Co., Jackson, Mich.
 Koehring Co., Milwaukee, Wis.
 Kwik-Mix Cone Mixer Co., Pt. Washington, Wis.
 Lansing Co., Lansing, Mich.
 Leach Co., Oshkosh, Wis.
 Orr & Sembower, Reading, Pa.
 Remmell Mfg. Co., Keweenaw, Wis.
 Smith Co., T. L., Milwaukee, Wis.

Mixers, Mortar
 *Davis, Inc., Norris K., San Francisco, Calif.
 *Jaeger Machine Co., Columbus, O.
 Anchor Mfg. Co., Chicago, Ill.
 Blystone Mfg. Co., Cambridge Spgs., Pa.
 C. H. & E. Mfg. Co., Milwaukee, Wis.
 Chain Belt Co., Milwaukee, Wis.
 Kwik-Mix Cone Mixer Co., Pt. Washington, Wis.
 Lansing Co., Lansing, Mich.
 Leach Co., Oshkosh, Wis.
 Talbot-Flood Mfg. Co., Kansas City, Mo.

Mortar Boxes (See Boxes)

Mortar Mixers (See Mixers)

Mortar Placing Machines (See Placers)

Motor Trucks (See Trucks)

Motors, Gasoline (See Engines)

Motors and Generators, Electric
 *Allis-Chalmers Mfg. Co., Milwaukee, Wis.
 *Homelite Corp., Port Chester, N. Y.
 American Motor Co., Cedarburg, Wis.
 Century Electric Co., St. Louis, Mo.
 Crocker-Wheeler Co., Amherst, N. J.
 Fairbanks, Morse & Co., Chicago
 General Electric Co., Schenectady, N. Y.
 Graybar Electric Co., New York
 Ideal Electric & Mfg. Co., Mansfield, O.
 Lincoln Electric Co., Cleveland, O.
 Northwestern Mfg. Co., Milwaukee, Wis.
 Robbins & Myers Co., Springfield, O.
 United States Motors Corp., Oshkosh, Wis.
 Wagner Electric Corp., St. Louis, Mo.
 Westinghouse E. & M. Co., E. Pittsburgh, Pa.

Mucking Machines
 *Allis-Chalmers Mfg. Co., Milwaukee, Wis.
 Coloder Co., Inc., The Columbus, Ohio
 Nordberg Mfg. Co., Milwaukee, Wis.
 St. Louis Power Shovel Co., St. Louis, Mo.

Nozzles, Sluicing (See Giants, Hydraulic)

Oilers, Road (See Distributors)

Oils, Road
 *Standard Oil Co. of Ind., Chicago
 *Standard Oil Co. of N. Y., New York
 Atlantic Refining Co., Inc., Philadelphia
 Barber Asphalt Co., Philadelphia
 Headley Emulsified Prod. Co., Philadelphia
 Standard Oil Co. of La., New Orleans, La.
 Standard Oil Co. of N. J., Newark, N. J.
 Texas Co., The, New York

One-Ton Cranes (See Cranes)

Orange Peel Buckets (See Buckets)

Painting Machinery, Spray
 *Schramm, Inc., West Chester, Pa.
 Binks Spray Equipment Co., Chicago
 Chicago Pneu. Tool Co., New York
 DeVilbiss Mfg. Co., Toledo, Ohio
 Eclipse Air Brush Co., Newark, N. J.
 Hobart Brothers Co., Troy, Ohio
 MacLeod Co., Cincinnati, Ohio
 Mathews Corp., W. N., St. Louis, Mo.
 Milburn Co., Alexander, Baltimore, Md.
 Paasche Air Brush Co., Chicago, Ill.
 Simons Paint Spray Brush Co., Dayton, O.
 Spraco Painting Equip. Co., Boston, Mass.

Paints, Metal Protection
 *Carey Co., Philip, Cincinnati, O.
 *Solvay Sales Corp., New York
 Acme White Lead & Color Works, Detroit
 Barber Asphalt Co., Philadelphia
 Barrett Co., New York
 Berry Bros., Detroit, Mich.
 Cook Paint & Varnish Co., Kansas City, Mo.
 Detroit Graphite Co., Detroit, Mich.
 Detroit White Lead Works, Detroit, Mich.
 Dixon Crucible Co., Jos., Jersey City, N. J.
 du Pont de Nemours & Co., E. I., Wilmington, Del.
 Headley Emulsified Prod. Co., Philadelphia
 Hoosier Paint Works, Ft. Wayne, Ind.
 McEverlast, Inc., Los Angeles, Calif.
 Minwax Co., New York
 Pittsburgh Plate Glass Co., Milwaukee, Wis.
 Ruberoid Co., New York
 Sherwin-Williams Co., Cleveland, Ohio
 St. Louis Surfacers & Paint Co., St. Louis
 Toch Brothers, New York
 Tropical Paint & Oil Co., Cleveland, Ohio
 Truscon Laboratories, Detroit, Mich.
 Waller-Dove-Hermiston Corp., New York

Paper, Waterproof
 National Waterproofing Co., Philadelphia
 Sisalcraft Co., Chicago
 United Paper Co., E. Braintree, Mass.

Patrol Graders (See Graders)

Pavement Breakers (See Tools, Pneumatic)

Pavers, Concrete
 *Jaeger Machine Co., Columbus, Ohio
 *Ransome Conc. Machy. Co., Dunellen, N. J.
 Chain Belt Co., Milwaukee, Wis.
 Foote Co., Nunda, N. Y.
 Koehring Co., Milwaukee, Wis.
 Smith Co., T. L., Milwaukee, Wis.

Paving Brick (See Brick)

Paving Guards (See Guards)

Picks, Hand
 Ames-Baldwin-Wyoming Shovel Co., North Easton, Pa.
 Hubbard Co., Pittsburgh, Pa.
 Iron City Tool Works, Pittsburgh, Pa.
 Oliver Iron & Steel Corp., Pittsburgh, Pa.
 Verona Tool Works, Pittsburgh, Pa.
 Warren Tool & Forge Co., Warren, Ohio
 Warwood Tool Co., Wheeling, W. Va.

Pile Drivers (See Hammers)

Pile Hammers (See Hammers)

Piles, Concrete
 MacArthur Cone, Pile & Foundation Co., New York
 Massey Concrete Prods. Corp., Chicago
 Raymond Concrete Pile Co., New York

Piling, Sheet, Interlocking, Steel
 Bethlehem Steel Co., Bethlehem, Pa.
 Carnegie Steel Co., Pittsburgh, Pa.
 Lindheimer, S. W., Chicago
 Sheet Piling, Inc., New York
 Wemlinger, Inc., New York

Pipe, Cast Iron
 *U. S. Pipe & Fdy. Co., Burlington, N. J.
 American Cast Iron Pipe Co., Birmingham, Ala.
 Central Foundry Co., New York
 Clow & Sons, James B., Chicago
 Donaldson Iron Co., Emmaus, Pa.
 Fox & Co., John, New York
 Glamorgan Pipe & Fdy. Co., Lynchburg, Va.
 McWane Cast Iron Pipe Co., Birmingham, Ala.
 National C. I. Pipe Co., Birmingham, Ala.
 Warren Fdy. & Pipe Co., New York
 Wood & Co., R. D., Philadelphia

Pipe, Concrete
 *Newark Concrete Pipe Co., Newark, N. J.
 Gray Concrete Co., Thomasville, N. C.
 Lock Joint Pipe Co., Amherst, N. J.
 Massey Concrete Prods. Corp., Chicago
 Shearman Conc. Pipe Co., Inc., Little Rock, Ark.

Pipe, Concrete, Reinforced
 *Newark Conc. Pipe Co., Newark, N. J.
 Concrete Products Co., Pittsburgh, Pa.
 Independent Concrete Pipe Co., Indianapolis
 Lock Joint Pipe Co., Amherst, N. J.
 Massey Concrete Prods. Corp., Chicago
 Shearman Conc. Pipe Co., Inc., Little Rock, Ark.

Pipe, Culvert (See Culverts; or Pipe, Concrete)

Pipe, Lead
 Clow & Sons, James B., Chicago
 Eagle-Picher Lead Co., Chicago
 Gardner Metal Co., Chicago
 National Lead Co., New York
 United Lead Co., New York
 Windsor Mfg. Co., Milwaukee, Wis.

Pipe, Steel
 Babcock & Wilcox Tube Co., New York
 Bethlehem Steel Co., Bethlehem, Pa.
 Biggs Boiler Works Co., Akron, Ohio
 Clow & Sons, James B., Chicago
 Jones & Laughlin Steel Co., Pittsburgh
 Lancaster Iron Works, Lancaster, Pa.
 National Tube Co., Pittsburgh, Pa.
 Petroleum Iron Works, Sharon, Pa.
 Wheeling Steel Corp., Wheeling, W. Va.
 Youngstown Sheet & Tube Co., Youngstown, O.

Pipe, Steel, Spiral
 Abendroth & Root Mfg. Co., New York
 American Rolling Mill Co., Middletown, Ohio
 Chicago Metal Mfg. Co., Chicago
 Taylor Forge & Pipe Works, Chicago

Pipe, Steel or Iron, Riveted
 *Connery & Co., Inc., Philadelphia
 *Honnest Co., Jos., Cincinnati, Ohio
 *Littleford Bros., Cincinnati, Ohio
 Abendroth & Root Mfg. Co., New York
 Biggs Boiler Works Co., Akron, Ohio
 Birmingham Tank Co., Birmingham, Ala.
 Chattanooga Boiler & Tank Co., Chattanooga
 Chicago Bridge & Iron Works, Chicago
 East Jersey Pipe Co., New York
 Ellicot Mach. Corp., Baltimore, Md.
 Graver Tank & Mfg. Corp., E. Chicago, Ind.
 Hammond Iron Works, Warren, Pa.
 Hardesty Mfg. Co., H. Denver, Colo.
 Horton Stl. Tank & Mfg. Co., Chicago
 Lancaster Iron Works, Lancaster, Pa.
 Petroleum Iron Works Co., Sharon, Pa.
 Pittsburgh-Des Moines Stl. Co., Pittsburgh
 Stover Steel Tank & Mfg. Co., Freeport, Ill.
 Taylor Forge & Pipe Works, Chicago
 Tippett & Wood, Phillipsburg, N. J.

Pipe, Vitrified Clay
 Doe Co., Wm. E., Chicago, Ill.
 Dickey Clay Mfg. Co., W. S., Kansas City
 Evans & Howard Fire Brick Co., St. Louis
 Laclede-Christy Clay Prods. Co., St. Louis
 Pacific Clay Products Co., Los Angeles, Calif.

Pipe, Wood
 Buffelen Pipe & Creosoting Co., Tacoma, Wash
 Federal Tank & Pipe Co., Seattle, Wash.
 Michigan Pipe Co., Bay City, Mich.
 Pacific Tank & Pipe Co., San Francisco, Calif.
 Redwood Mfrs. Co., San Francisco, Calif.
 Standard Wood Pipe Co., Williamsport, Pa.
 Wyckoff & Sons Co., A., Elmira, N. Y.

Pipe, Wrought Iron
 Byers Co., A. M., Pittsburgh, Pa.
 Cohoes Rolling Mill Co., Cohoes, N. Y.
 Reading Iron Co., Reading, Pa.
 South Chester Tube Co., Chester, Pa.

Pipe Bending Machines (See Bending Machines)

Pipe Covering (See Covering)

Pipe Cutters (See Cutters)

Pipe Fittings (See Fittings)

Pipe Forcing Jacks (See Jacks)

Pipe Handling Machinery (See Derricks)

Pipe Joint Materials (See Joint Materials)

Pipe Joints, Flexible (See Joints)

Pipe Laying Derricks (See Derricks)

Pipe Pushers (See Jacks)

Pipe Threaders (See Threaders)

Placers, Concrete, Pneumatic
 *Ransome Concrete Machy. Co., Dunellen, N. J.

* Indicates that the manufacturer carries an advertisement. See index facing inside back cover *



Photo Courtesy Jernigan Photo Service

201 miles of DELAVAUD PIPE in the water system of Fort Worth

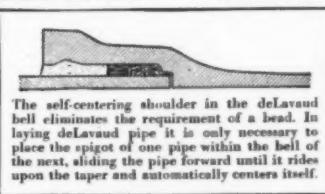
Fort Worth, Texas, is recognized as one of the most progressive centers of our great southwest. Here are wide, modern streets flanked by handsome municipal buildings and tall skyscrapers. Here are large modern hotels, theatres and schools. And, beneath the streets of this modern city, more than two hundred miles of deLavaud water mains are giving splendid service.

DeLavaud Pipe was chosen for Fort Worth for the same reason that it was and is being specified by other enterprising cities—its record of economy and excellent performance.

DeLavaud Pipe is produced by pouring molten iron into a rapidly revolv-

ing cylindrical mold. Centrifugal force holds the molten metal against the sides of the mold and drives out impurities with a force many times greater than gravity. The metal of deLavaud Pipe is extremely dense and fine-grained. Tests have proved it to be at least 25% stronger than pit cast pipe.

DeLavaud Pipe is light in weight too; easy and economical to handle. It is remarkably satisfactory to cut and tap, and it offers approximately 5% greater carrying capacity for the same outside diameter. The illustrated deLavaud Handbook gives detailed information. Write for free copy.



United States Pipe and Foundry Co., Burlington, N.J.

Sales Offices:
New York

Philadelphia
Pittsburgh

Cleveland
Buffalo
Chicago

Our pipe bears the "Q-Check" trademark of The Cast Iron Pipe Research Association

Dallas
Birmingham
Kansas City

Minneapolis
Seattle

San Francisco
Los Angeles

* * * * WHERE TO PURCHASE * * * *

Placers, Mortar, Pneumatic
 *Ransome Concrete Machy. Co., Dunellen, N. J.
 Cement Gun Co., Allentown, Pa.
 Conley Plastering Machine Co., Compton, Calif.
 Macleod Co., Cincinnati, Ohio
 Pneumatic Corp., Ltd., Long Beach, Calif.

Planes, Electric
 Carter Co., Inc., R. L., Phoenix, N. Y.
 Wappat, Inc., Pittsburgh, Pa.

Planes, Pneumatic
 *Tousley Tool Co., Cleveland, Ohio

Planking, Asphalt (See Flooring)

Plants, Construction (See Specific Types)

Plows, Road and Rooter
 *Austin-Western Road Machy. Co., Chicago
 *General Wheelbarrow Co., Cleveland, Ohio
 *LaPlant-Cheata Mfg. Co., Inc., Cedar Rapids, Iowa
 Acme Road Machy. Co., Frankfort, N. Y.
 Adams Co., J. D., Indianapolis, Ind.
 American Steel Scraper Co., Sidney, Ohio
 Beach Mfg. Co., Charlotte, Mich.
 Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
 Deere & Co., Moline, Ill.
 Gallon Iron Wks. & Mfg. Co., Gallon, Ohio
 Hackley Equip. Co., P. B., San Francisco
 Harris Co., B. W. & Leo, Minneapolis, Minn.
 Sidney Steel Scraper Co., Sidney, Ohio
 Sinauer-McLean Scraper Co., Sidney, Ohio
 Spears-Wells Machy. Co., Oakland, Calif.
 Western Wheeled Scraper, Co., Aurora, Ill.
 Wiard Plow Co., Batavia, N. Y.

Plows, Snow (See Snow Removal Machinery)

Pneumatic Tools (See Tools, Pneumatic)

Portable Buildings, Steel (See Buildings)

Portable Steel Derricks (See Derricks)

Portland Cement (See Cement)

Post Hole Augers (See Augers)

Pots, Pouring, Asphalt and Tar
 *Littleford Bros., Cincinnati, Ohio
 Acme Road Machy. Co., Frankfort, N. Y.
 Barber Asphalt Co., Philadelphia
 Beach Mfg. Co., Charlotte, Mich.
 Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
 Durlach Can & Iron Wks., Brooklyn, N. Y.
 Mohawk Asph. Heater Co., Schenectady, N. Y.
 Tarrant Mfg. Co., Saratoga Springs, N. Y.

Powder, Black
 Atlas Powder Co., Wilmington, Del.
 du Pont de Nemours & Co., E. I., Wilmington.
 Egyptian Powder Co., East Alton, Ill.
 Giant Powder Co., San Francisco, Calif.
 Hercules Powder Co., Wilmington, Del.
 Trojan Powder Co., Allentown, Pa.
 United States Powder Co., Terre Haute, Ind.

Power Pumps (See Pumps)

Power Transmission (See Chains or Belts)

Presses, Baling
 Davenport Mfg. Co., Davenport, Ia.
 Economy Baler Co., Ann Arbor, Mich.
 Famous Mfg. Co., E. Chicago, Ind.
 Galland-Henning Mfg. Co., Milwaukee, Wis.

Puller Jacks (See Jacks)

Pullers, Stump
 *Bebe Bros., Inc., Seattle, Wash.
 Bennett & Co., H. L., Westerville, Ohio
 Clyde Iron Wks. Sales Co., Duluth, Minn.
 Dorsey Bros., Elba, Ala.
 Waldron Corp., John, New Brunswick, N. J.

Pumping Outfits, Diaphragm
 *Jaeger Machine Co., Columbus, Ohio
 *Novo Engine Co., Lansing, Mich.
 *Sterling Machy. Corp., Kansas City, Mo.
 Barnes Mfg. Co., Mansfield, Ohio
 Chain Belt Co., Milwaukee, Wis.
 C. H. & E. Mfg. Co., Milwaukee, Wis.
 Humphreys Mfg. Co., Mansfield, Ohio
 Marlow, A. S., Ridgewood, N. J.
 Nelson Bros. Co., Saginaw, Mich.
 Tool & Device Corp., Waterford, N. Y.
 Trench & Marine Pump Co., New York

Pumps, Air-Lift
 *Worthington Pump & Machy. Corp., Harrison, N. J.

American Steam Pump Co., Battle Creek, Mich.
 Chicago Pneumatic Tool Co., New York
 Gardner-Denver Co., Quincy, Ill.
 Indiana Pump & Compressor Co., Indianapolis
 Ingersoll-Rand Co., New York
 Sullivan Machinery Co., Chicago

Pumps, Centrifugal
 *Domestic Eng. & Pump Co., Shippensburg, Pa.
 *Homelite Corp., Port Chester, N. Y.
 *Jaeger Machine Co., Columbus, Ohio
 *Novo Engine Co., Lansing, Mich.
 *Sterling Machy. Corp., Kansas City, Mo.
 American Stm. Pump Co., Battle Creek, Mich.
 Barnes Mfg. Co., Mansfield, Ohio
 Carter Co., Ralph B., Hackensack, N. J.
 Chain Belt Co., Milwaukee, Wis.
 Deming Co., Salem, Ohio
 Humphreys Mfg. Co., Mansfield, Ohio
 LaBoar Co., Inc., Elkhart, Ind.
 Lawrence Pump & Engine Co., Lawrence, Mass.
 Marlow, A. S., Ridgewood, N. J.
 Portable Power Co., New York
 Trench & Marine Pump Co., New York
 Union Iron Works, Inc., Hoboken, N. J.

Pumps, Deep Well
 *Domestic Eng. & Pump Co., Shippensburg, Pa.
 *Keystone Driller Co., Beaver Falls, Pa.
 *Novo Engine Co., Lansing, Mich.
 *Worthington Pump & Machy. Corp., Harrison, N. J.

Alamo Engine Co., Hillsdale, Mich.
 Aldrich Pump Co., Allentown, Pa.
 American Stm. Pump Co., Battle Creek, Mich.
 American Well Works, Aurora, Ill.
 Barnes Mfg. Co., Mansfield, Ohio
 Byron Jackson Co., Berkeley, Calif.
 Cook, Inc., A. D., Lawrenceburg, Ind.
 Dean Hill Pump Co., Anderson, Ind.
 Deming Co., Salem, Ohio
 Gardner-Denver Co., Quincy, Ill.
 Goulds Pumps Inc., Seneca Falls, N. Y.
 Humphreys Mfg. Co., Mansfield, Ohio
 Indians Pump & Comp. Co., Indianapolis, Ind.
 Ingersoll-Rand Co., New York
 Layne & Bowler, Inc., Memphis, Tenn.
 McDonald Mfg. Co., A. Y., Dubuque, Iowa
 Myers & Bros. Co., F. E., Ashland, Ohio
 Pomona Pump Co., Pomona, Calif.
 Rumsey Pump Co., Seneca Falls, N. Y.
 Sterling Pump Corp., Stockton, Calif.
 Weinman Pump Mfg. Co., Columbus, Ohio

Pumps, Diaphragm
 *Construction Machinery Co., Waterloo, Ia.
 *Brown Clutch Co., Sandusky, Ohio
 *Domestic Eng. & Pump Co., Shippensburg, Pa.
 *Dorr Co., New York
 *Jaeger Machine Co., Columbus, Ohio
 *Novo Engine Co., Lansing, Mich.
 Barnes Mfg. Co., Mansfield, Ohio
 Carter Co., Ralph B., Hackensack, N. J.
 Chain Belt Co., Milwaukee, Wis.
 C. H. & E. Mfg. Co., Milwaukee, Wis.
 Deming Co., Salem, Ohio
 Edison Mfg. Corp., South Boston, Mass.
 Goulds Pumps Inc., Seneca Falls, N. Y.
 Humphreys Mfg. Co., Mansfield, Ohio
 Marlow, A. S., Ridgewood, N. J.
 Waldo Bros. Co., Boston, Mass.
 Witte Engine Works, Kansas City, Mo.

Pumps, Dredging
 *Novo Engine Co., Lansing, Mich.
 Elicott Mach. Corp., Baltimore, Md.
 Erie Pump & Engine Works, Medina, N. Y.
 Lawrence Pump & Engine Co., Lawrence, Mass.
 Morris Machine Works, Baldwinsville, N. Y.

Pumps, Power
 *Allis-Chalmers Mfg. Co., Milwaukee, Wis.
 *Brown Clutch Co., Sandusky, Ohio
 *Domestic Eng. & Pump Co., Shippensburg, Pa.
 *Homelite Corp., Port Chester, N. Y.
 Jaeger Machine Co., Columbus, Ohio
 *Keystone Driller Co., Beaver Falls, Pa.
 *Novo Engine Co., Lansing, Mich.
 *Worthington Pump & Machy. Corp., Harrison, N. J.

Alamo Iron Works, San Antonio, Texas

Aldrich Pump Co., Allentown, Pa.
 American Steam Pump Co., Battle Creek, Mich.
 American Well Works, Aurora, Ill.
 Aurora Pump & Mfg. Co., Aurora, Ill.
 Barnes Mfg. Co., Mansfield, Ohio
 C. H. & E. Mfg. Co., Milwaukee, Wis.
 Chicago Pump Co., Chicago
 Dayton-Dowd Co., Quincy, Ill.
 Dean Bros. Co., Indianapolis, Ind.
 De LaVal Steam Turbine Co., Trenton, N. J.
 Deming Co., Salem, Ohio
 Fairbanks, Morse & Co., Chicago
 Gardner-Denver Co., Quincy, Ill.
 Goulds Pumps Inc., Seneca Falls, N. Y.
 Humphreys Mfg. Co., Mansfield, Ohio
 Ingersoll-Rand Co., New York
 Kinney Mfg. Co., Boston, Mass.
 LaBoar Co., Inc., Elkhart, Ind.
 Lawrence Pump & Engine Co., Lawrence, Mass.
 Lecourtenay Co., Newark, N. J.
 Myers & Bros. Co., F. E., Ashland, Ohio
 Rumsey Pump Co., Seneca Falls, N. Y.
 Weinman Pump Mfg. Co., Columbus, Ohio
 Yeomans Bros. Co., Chicago

Pumps, Quadruplex
 *Sterling Machy. Corp., Kansas City, Mo.

Pumps, Tar and Asphalt
 *Worthington Pump & Machy. Corp., Harrison, N. J.

Pumps, Triples
 *Domestic Eng. & Pump Co., Shippensburg, Pa.
 *Jaeger Machine Co., Columbus, Ohio
 *Novo Engine Co., Lansing, Mich.
 *Worthington Pump & Machy. Corp., Harrison, N. J.

Aldrich Pump Co., Allentown, Pa.
 American Steam Pump Co., Battle Creek, Mich.
 Barber Asphalt Co., Philadelphia
 Gardner-Denver Co., Quincy, Ill.
 Goulds Pumps Inc., Seneca Falls, N. Y.
 Kinney Mfg. Co., Boston, Mass.
 Madsen Iron Works, Huntington Pk., Calif.

Radial Brick Chimneys (See Chimneys)

Radiators for Gasoline Engines
 McCord Radiator Mfg. Co., Detroit, Mich.
 Modine Mfg. Co., Racine, Wis.
 Perfex Corp., Milwaukee, Wis.
 Young Radiator Co., Racine, Wis.

Rail and Rail Joints
 Bethlehem Steel Co., Bethlehem, Pa.
 Carnegie Steel Co., Pittsburgh, Pa.
 Koppel Ind. Car & Equip. Co., Koppel, Pa.
 Sweet's Steel Co., Williamsport, Pa.

Railway Cars (See Cars)

Rams, Hydraulic
 Deming Co., Salem, Ohio
 Goulds Pumps Inc., Seneca Falls, N. Y.
 Johnson Mfg. Co., Seattle, Wash.
 Rife Hydraulic Engine Co., New York
 Rumsey Pump Co., Seneca Falls, N. Y.

Reinforced Concrete Pipe (See Pipe)

Reinforcing Fabric for Concrete (See Wire Fabric)

Reinforcing Steel for Concrete (See Steel Reinforcing)

Relief Valves (See Valves)

Revolving Derricks (See Derricks)

Rivet Forges (See Forges)

Riveted Pipe (See Pipe)

Riveters, Pneumatic (See Tools, Pneumatic)

Road Drags (See Drags)

Road Finishers (See Finishers)

Road Graders (See Graders)

Road Maintainers (See Maintainers)

Road-Mix Machines, Pick-Up
 Barber-Greene Co., Aurora, Ill.
 Iowa Mfg. Co., Cedar Rapids, Iowa

Road-Mix Machines, Surface
 *Etnyre & Co., Inc., E. D., Oregon, Ill.

Road Oils (See Oils)

Road Oilers (See Distributors)

Road Plows (See Plows)

Road Rollers (See Rollers)

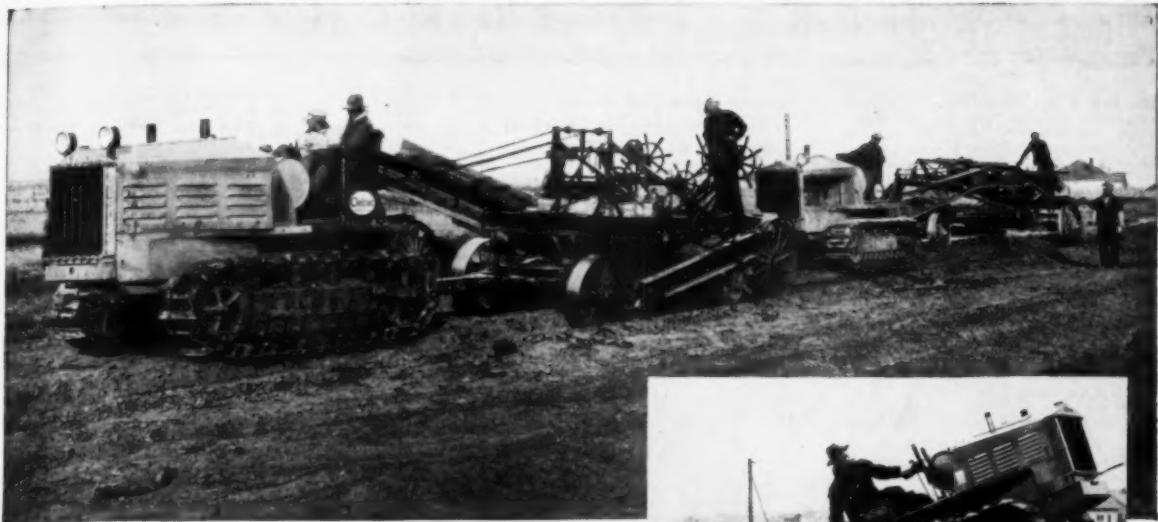
Road Scrapers (See Maintainers)

Rock Asphalt (See Asphalt, Rock)

Rock Crushers (See Crushers)

Rock Drills (See Drills)

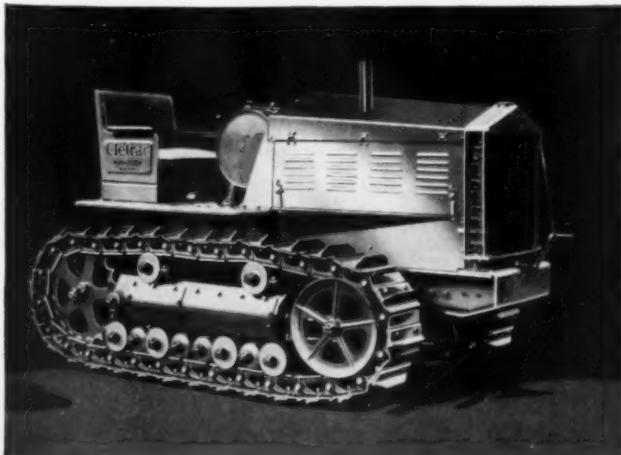
Rock Cutters (See Cutters)



BIG JOBS

HERE ARE 5 TRACTOR SIZES
—FIFTEEN TO EIGHTY H. P.—
to meet EVERY POWER NEED

THERE are no jobs too big or too little for Cletrac Crawler Tractors. They are built in a complete line-up of sizes to match the requirements of your entire range of work. Whether it's a power-eating job with big elevating graders or the comparatively small operation of a half yard fresno, there's a Cletrac size to fit—and save you money on the job.



or LITTLE

Cletrac Crawlers are real money-savers and money-makers on any job they tackle. They deliver their full rated power at the draw-bar and still have a 25% margin in reserve for over-loads. They travel fast and go anywhere on their broad, sure-gripping tracks. They maneuver nimbly and can be swung around with only finger pressure at the controls.

You will like Cletrac's features of patented planetary gear steering, the sturdy construction and simplified engineering, the complete dust-proofing and continuous oiling that saves time and repair costs.

Get the complete story of these efficient tractors and how they can serve you better and more economically. The Cletrac distributor near you will gladly demonstrate—or write direct for full information.

THE CLEVELAND TRACTOR COMPANY
19321 Euclid Avenue Cleveland, Ohio

CLETRAC
CRAWLER TRACTORS

* * * * WHERE TO PURCHASE * * * *

Rods and Wires, Welding

*American Steel & Wire Co., Chicago
American Brass Co., Waterbury, Conn.
American Arc Welders, Roseau, Minn.
American Manganese Steel Co., Inc., Chicago
Hts., Ill.

Atlas Foundry Co., Cleveland, Ohio
Central Steel & Wire Co., Chicago
Elec. Arc Cutting & Welding Co., Newark, N.J.
Fusion Welding Corp., Schenectady, N.Y.
General Electric Co., Schenectady, N.Y.
Hotline Corp., Chicago
Koro Corp., Bellwood, Ill.
Lincoln Electric Co., Cleveland, Ohio
Linde Air Products Co., The, New York
Page Steel & Wire Co., Bridgeport, Conn.
Roehling's Sons Co., John A., Trenton, N.J.
Seneca Wire & Mfg. Co., Fostoria, Ohio
Smith Welding Equip. Corp., Minneapolis
Steel Sales Corp., Chicago
Stoody Co., Whittier, Calif.
Wickwire Spencer Steel Co., New York
Wilson Welder & Metals Co., No. Bergen, N.J.

Rollers, Embankment

*Buffalo-Springfield Roller Co., Springfield, O.
*Euclid Road Machy. Co., Cleveland, Ohio
Acme Road Machinery Co., Frankfort, N.Y.
Eholt & Co., H. W., Los Angeles, Calif.

Rollers, Road and Paving

*Austin-Western Road Machy. Co., Chicago
*Buffalo-Springfield Roller Co., Springfield, O.
*Hercules Co., Marion, Ohio
*Huber Mfg. Co., Marion, Ohio
*Riddell Co., W. A., Bucyrus, Ohio
Acme Road Machy. Co., Frankfort, N.Y.
Barber Asphalt Co., Philadelphia
Beach Mfg. Co., Charlotte, Mich.
Davenport Loco. & Mfg. Corp., Davenport, Ia.
Erie Machine Shops, Erie, Pa.
Galion Iron Works & Mfg. Co., Gallon, Ohio
Good Roads Machy. Co., Kennett Square, Pa.
Horst & Strietner Co., Davenport, Iowa
Universal Road Machy. Co., Kingston, N.Y.
Wehr Co., Cudahy, Wis.

Rollers, Trench

*Trackson Co., Milwaukee, Wis.

Rooter Plows (See Plows)

Rope, Manila

*Williamsport Wire Rope Co., Williamsport, Pa.
American Mfg. Co., Brooklyn, N.Y.
Columbian Rope Co., Auburn, N.Y.
Cupples Cordage Co., Brooklyn, N.Y.
Dobbie Fdy. & Mach. Co., Niagara Falls, N.Y.
Hooven & Allison Co., Xenia, Ohio
Hunt Co., Inc., C. W. W., New Brighton, N.Y.
Kelly Co., R. A., Xenia, Ohio
New Bedford Cordage Co., New Bedford, Mass.
Pearl Cordage Co., Peoria, Ill.
Plymouth Cordage Co., N. Plymouth, Mass.
Portland Cordage Co., Portland, Ore.
St. Louis Cordage Mills, St. Louis, Mo.
Tubbs Cordage Co., San Francisco, Calif.
Wall Rope Works, New York
Waterbury Co., New York
Whitlock Cordage Co., New York

Rope, Wire

*American Steel & Wire Co., Chicago
*Williamsport Wire Rope Co., Williamsport, Pa.
American Cable Co., Inc., New York
Broderick & Bascom Rope Co., St. Louis, Mo.
Fischer & Hayes Rope & Steel Co., Chicago
Green, L. P., Chicago
Hazard Wire Rope Co., Wilkes-Barre, Pa.
Leach & Sons Rope Co., A., St. Louis, Mo.
Macwhyre Co., Kenosha, Wis.
Page Steel & Wire Co., Bridgeport, Conn.
Roehling's Sons Co., John A., Trenton, N.J.
Upson-Walton Co., Cleveland, Ohio
Wickwire-Spencer Steel Co., New York

Rope Fittings, Wire (See Fittings)

Rotary Scrapers (See Scrapers)

Rubber Block Paving (See Block Paving)

Rubber Tires (See Tires)

Rules, Measuring

Kenefel & Esser Co., Hoboken, N.J.
Lufkin Rule Co., Saginaw, Mich.
Fees Co., C. F., Chicago
Westcott Rule Co., Seneca Falls, N.Y.
Salamanders, Coke or Wood-Burning

*General Wheelbarrow Co., Cleveland, Ohio
*Honhorst Co., Jas., Cincinnati, Ohio

*Littleford Bros., Cincinnati, Ohio

Donley Bros. Co., Cleveland, Ohio

Duriach Can & Iron Works, Brooklyn, N.Y.

Jackson Mfg. Co., Harrisburg, Pa.

Salamanders, Oil-Burning

*Littelford Bros., Cincinnati, Ohio

Aerol Burner Co., West New York, N.J.

American Steel Works, Kansas City, Mo.

Hanck Mfg. Co., Brooklyn, N.Y.

MacLeod Co., Cincinnati, Ohio

Mohawk Asph. Heater Co., Schenectady, N.Y.

Sand Dryers (See Dryers)

Sand Spreaders (See Spreaders)

Sand Washers (See Washers)

Saw Rigs, Portable

*Construction Machy. Co., Waterloo, Iowa
American Floor Surfacing Mach. Co., The
Toledo, Ohio
C. H. & E. Mfg. Co., Milwaukee, Wis.
Chain Belt Co., Milwaukee, Pa.
DeWalt Products Co., Lecia, Pa.
Jones Superior Machine Co., Chicago
Knickerbocker Co., Jackson, Mich.
Leach Co., Oshkosh, Wis.
Red Star Products Co., Cleveland, Ohio
White Engine Works, Kansas City, Mo.

Saws, Power, Hand

*Tousley Tool Co., Cleveland, Ohio
Black & Decker Mfg. Co., Towson, Md.
DeWalt Products Corp., Lancaster, Pa.
Ingersoll-Rand Co., New York
Irwin Mfg. Co., Cincinnati, Ohio
Michel Electric Hand Saw Co., Chicago
Portable Power Tool Corp., Warsaw, Ind.
Porter-Cable-Hutchinson Corp., Syracuse, N.Y.
Read-Prentiss Corp., Worcester, Mass.
Skilaw, Inc., Chicago
Speedway Mfg. Co., Cicero, Ill.
Stanley Electric Tool Co., New Britain, Conn.
Syntron Co., Pittsburgh, Pa.
U. S. Electrical Tool Co., The, Cincinnati
Van Dorn Elec. Tool Co., Baltimore, Md.
Wappat, Inc., Pittsburgh, Pa.
Wodack Electric Tool Corp., Chicago

Scaffold Accessories

Expansion Scaffold Clamp Co., Flushing, N.Y.
Scaffolds, Steel, Adjustable

*Toledo Pressed Steel Co., Toledo, Ohio
Fuller Co., H. B., Paul, Minn.
Steel Scaffolding Co., Evansville, Ind.
Tilley Ladders Co., Inc., The John, Watervliet, N.Y.

Scalifiers

*Austin-Western Road Machy. Co., Chicago
*Blaw-Knox Co., Pittsburgh, Pa.
*Buffalo-Springfield Roller Co., Springfield, O.
*Caterpillar Tractor Co., Peoria, Ill.
*Huber Mfg. Co., Marion, Ohio
*Hvass & Co., Inc., Chas., New York
*Riddell Co., W. A., Bucyrus, Ohio
Acme Road Machy. Co., Frankfort, N.Y.
Adams Co., J. D., Indianapolis, Ind.
American Tractor Equip. Co., Oakland, Calif.
Baker Mfg. Co., Springfield, Ill.
Galion Iron Works & Mfg. Co., Galion, O.
Good Roads Machy. Co., Kennett Square, Pa.
Rome Mfg. Co., Rome, N.Y.
Ryan Mfg. Co., Chicago
Spears-Wells Machy. Co., Oakland, Calif.
Universal Road Machy. Co., Kingston, N.Y.
Western Wheeled Scraper Co., Aurora, Ill.
Ward Plow Co., Batavia, N.Y.

Scalifiers, Teeth for

*Shunk Mfg. Co., Bucyrus, Ohio
American Manganese Steel Co., Inc., Chicago
Hts., Ill.
Unit Corp. of Amer., Forgings Div., Milwaukee

Scoops, Hand (See Shovels)

Scoops, Horse or Tractor Drawn (See Scrapers, Drag; Scrapers, Rotary; or Scrapers, Wheeled)

Scoops, Skimmer and Trench (See Shovels, Convertible)

Scrapers, Drag (or Pans)

*Austin-Western Road Machy. Co., Chicago
Adams Co., J. D., Indianapolis, Ind.
American Steel Scraper Co., Sidney, Ohio
Chattanooga Wheelbarrow Co., Chattanooga, Tenn.

Harris Co., B. W. & Leo, Minneapolis, Minn.
Jackson Mfg. Co., Harrisburg, Pa.
Lansing Co., Lansing, Mich.

Sidney Steel Scraper Co., Sidney, Ohio
Slusser-McLean Scraper Co., Sidney, Ohio
Western Wheeled Scraper Co., Aurora, Ill.

Scrapers, Drag, Power (For use on Dragline Cableways)

*Diamond Iron Works, Inc., Minneapolis, Minn.

*Hayward Co., New York

*Sauerma Bros., Chicago

Beach Mfg. Co., Charlotte, Mich.

Beaumont Co., R. H., Philadelphia

Garst Mfg. Co., Chicago

Green, L. P., Chicago

Iowa Mfg. Co., Cedar Rapids, Iowa

Scrapers, Drag (agile) (For use on Cranes)

American Manganese Steel Co., Inc., Chicago

Hts., Ill.

Browning Crane Co., Cleveland, Ohio

Bucyrus-Erie Co., So. Milwaukee, Wis.

Bucyrus-Monigan Co., Chicago
Erie Steel Const. Co., Erie, Pa.
Harnischfeger Corp., Milwaukee, Wis.

Link-Belt Co., Chicago

Page Engineering Co., Chicago

Scrapers, Fresno (See Scrapers, Rotary)

Scrapers, Road (See Maintainers)

Scrapers, Rotary

*Austin-Western Road Machy. Co., Chicago
*Euclid Road Machy. Co., Cleveland, Ohio
*Farm Tools, Inc., Mansfield, Ohio

*General Wheelbarrow Co., Cleveland, Ohio
*La Plante-Choate Mfg. Co., Inc., Cedar Rapids, Iowa

*Schaefer Co., Gustav, Cleveland, Ohio
Adams Co., J. D., Indianapolis, Ind.
American Steel Scraper Co., Sidney, Ohio
Atlas Scraper Co., Los Angeles, Calif.
Baker Mfg. Co., Springfield, Ill.
Beach Mfg. Co., Charlotte, Mich.
Galion Iron Works & Mfg. Co., Galion, Ohio
Harris Co., B. W. & Leo, Minneapolis, Minn.
Killefer Mfg. Corp., Los Angeles, Calif.
Lansing Co., Lansing, Mich.
Sidney Steel Scraper Co., Sidney, Ohio
Slusser-McLean Scraper Co., Sidney, Ohio
Solano Iron Works, Berkeley, Calif.
Western Wheeled Scraper Co., Aurora, Ill.
Ward Plow Co., Batavia, N.Y.

Scrapers, Self-Loading (See Scrapers, Rotary)

Scrapers, Wheeled

*Austin-Western Rd. Machy. Co., Chicago
*Euclid Road Machy. Co., Cleveland, Ohio
*General Wheelbarrow Co., Cleveland, Ohio

*Riddell Co., W. A., Bucyrus, Ohio
Acme Road Machy. Co., Frankfort, N.Y.
Adams Co., J. D., Indianapolis, Ind.
American Steel Scraper Co., Sidney, Ohio
Atlas Scraper Co., Los Angeles, Calif.

Baker Mfg. Co., Springfield, Ill.
Beach Mfg. Co., Charlotte, Mich.
Galion Iron Works & Mfg. Co., Galion, Ohio
Harris Co., B. W. & Leo, Minneapolis, Minn.
Highway Trailer Co., Edgerton, Wis.
Lansing Co., Lansing, Mich.

Miami Trailer Scraper Co., Troy, Ohio
Miskin Scraper Works, Ucon, Idaho
Shaw Exc. & Tools Co., Worthington, Ohio
Sidney Steel Scraper Co., Sidney, Ohio
Slusser-McLean Scraper Co., Sidney, Ohio
Western Wheeled Scraper Co., Aurora, Ill.
Willamette-Ersted Co., Portland, Ore.

Scraeds, Hand

*Heltz Steel Form & Iron Co., Warren, O.

Screens, Sand and Gravel

*Allis-Chalmers Mfg. Co., Milwaukee, Wis.

*Austin-Western Road Machy. Co., Chicago

*Diamond Iron Works, Inc., Minneapolis, Minn.

*Littleford Bros., Cincinnati, Ohio

*Pioneer Gravel Equip. Mfg. Co., Minneapolis
Acme Road Machy. Co., Frankfort, N.Y.
Atlas Engg. Co., Clintonville, Wis.

Barber-Greene Co., Aurora, Ill.

Bartlett & Snow Co., O. C., Cleveland, Ohio

Beach Mfg. Co., Charlotte, Mich.

Chain Belt Co., Milwaukee, Wis.

Chicago Automatic Conv. Co., Chicago

Deister Concentrator Co., Ft. Wayne, Ind.

Gifford-Wood Co., Hudson, N.Y.

Good Roads Machy. Co., Kennett Square, Pa.

Haiss Mfg. Co., Geo., New York

Hendrick Mfg. Co., Carbondale, Pa.

Iowa Mfg. Co., Cedar Rapids, Iowa

Jeffrey Mfg. Co., Columbus, Ohio

Link-Belt Co., Chicago, Ill.

Merriman Asphalt Plant, Inc., Lima, Ohio

Morrow Mfg. Co., Wellston, Ohio

Neff & Fry Co., Camden, Ohio

New England Road Machy. Co., South Boston, Mass.

New Holland Machine Co., New Holland, Pa.

New Jersey Wire Cloth Co., Trenton, N.J.

Robins Coav. Belt Co., New York

Rogers Iron Works Co., Joplin, Mo.

Sackett Screen & Chute Co., H. B., Chicago

Smith Engineering Works, Milwaukee, Wis.

Stephens-Adamson Mfg. Co., Aurora, Ill.

W. Toepper & Sons Co., Milwaukee, Wis.

Traylor Engg. & Mfg. Co., Allentown, Pa.

United Iron Works, Kansas City, Mo.

Universal Crusher Co., Cedar Rapids, Iowa

Universal Road Machy. Co., Kingston, N.Y.

Wehster & Weller Mfg. Co., Chicago

Weimer Co., H. W., Milwaukee, Wis.

Western Wheeled Scraper Co., Aurora, Ill.

Semi-Trailers (See Trailers)

Sewer Blocks, Segment (See Blocks)

Sewer Castings (See Castings)

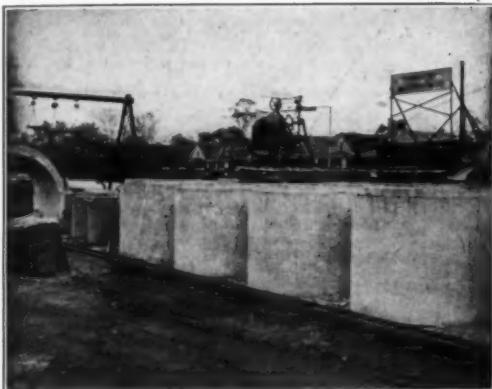
Sewer Pipe (See Pipe, Concrete, Vitrified Clay or Cast Iron)

Sewer Pipe Joint Compounds (See Compounds)

* Indicates that the manufacturer carries an advertisement. See index facing inside back cover *

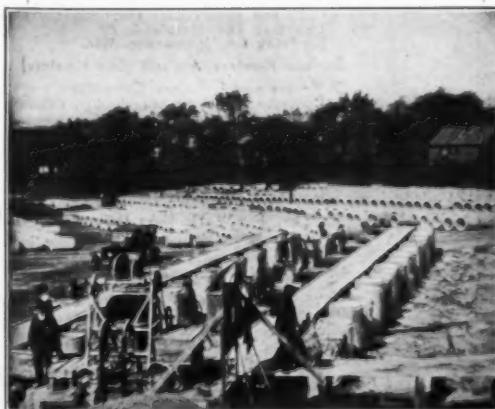
Newark
REINFORCED CONCRETE PIPE
"It makes a better joint"

**Easily laid at
small expense
with perfect
flow line.**

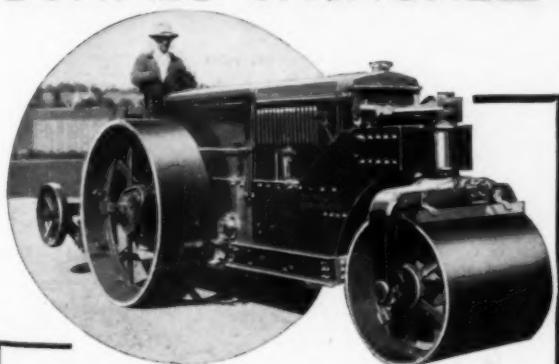


**NEWARK CONCRETE
PIPE COMPANY**

323 Broadway
Newark, New Jersey



BUFFALO-SPRINGFIELD



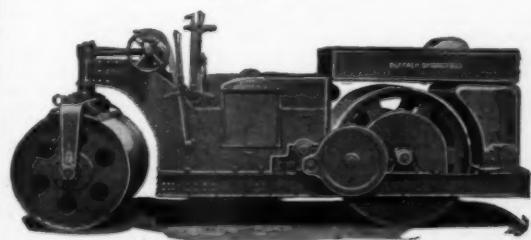
WHEN there is a time limit to consider. . . . When every hour lost is usually a serious matter. . . . Then does the contractor appreciate the rugged reliability of his Buffalo-Springfield roller.

Whether on new construction or maintenance, the Buffalo-Springfield develops the flawless performance that meets every requirement with true economy.

Built in a wide range of sizes. Steam and motor driven. Three-wheel and tandem. Scarifier and other attachments optional. Write for illustrated booklet.

**THE BUFFALO - SPRINGFIELD
ROLLER CO.**

Springfield, Ohio



**Buffalo-Springfield
ROLLERS**

* * * * WHERE TO PURCHASE * * * *

Sharpeners, Drill-Steel

*Hardsoc Wunder Drill Co., Ottumwa, Iowa
*Schramm, Inc., West Chester, Pa.
Gardner-Denver Co., Quincy, Ill.
Ingersoll-Rand Co., New York
Lake Shore Engine Works, Marquette, Mich.
Sullivan Machinery Co., Chicago

Sheet Steel Piling (See Piling)

Sheeting Drivers (See Hammers)

Shores

Concrete Engg. Co., Omaha, Neb.
Dayton Sure Grip & Shore Co., Dayton, Ohio
M. & M. Wire Clamp Co., Minneapolis, Minn.
O. D. G. Co., Owensboro, Ky.
Red Star Products Corp., Cleveland, Ohio
Hoos Co., H. W., Cincinnati, Ohio
Hoos-Moyer-Hecht Co., Cincinnati, Ohio
Symons Clamp & Mfg. Co., Chicago
Toledo Steel Tube Co., Toledo, Ohio
Universal Form Clamp Co., Chicago

Shovels, Convertible

*Bay City Shovels, Inc., Bay City, Mich.
*General Excavator Co., Marion, Ohio
*Keystone Driller Co., Beaver Falls, Pa.
*Michigan Power Shovel Co., Benton Harbor, Mich.
*Ohio Locomotive Crane Co., Bucyrus, Ohio
*Osgood Co., Marion, Ohio
American Hoist & Derrick Co., St. Paul, Minn.
Austin Machinery Corp., Muskegon, Mich.
Buckeye Traction Ditcher Co., Findlay, Ohio
Bucyrus-Erie Co., So. Milwaukee, Wis.
Byers Mach. Co., Ravenna, Ohio
Inaley Mfg. Co., Indianapolis, Ind.
Koehring Co., Milwaukee, Wis.
Manitowoc Engg. Works, Manitowoc, Wis.
Mead-Morrison Mfg. Co., Boston, Mass.
Northwest Engineering Co., Chicago
Ohio Power Shovel Co., Lima, Ohio
Orton Crane & Shovel Co., Chicago
Pontiac Tractor Co., Pontiac, Mich.
Speeder Machy. Corp., Cedar Rapids, Iowa
Star Drilling Machine Co., Akron, Ohio
Trow Shovel Co., Lorain, Ohio

Shovels, Diesel

*Osgood Co., Marion, Ohio
Bucyrus-Erie Co., So. Milwaukee, Wis.
Harnischfeger Corp., Milwaukee, Wis.
Industrial Brownhoist Corp., Cleveland, O.
Klauber Mfg. Co., Dubuque, Iowa
Koehring Co., Milwaukee, Wis.
Link-Belt Co., Chicago
Marion Steam Shovel Co., Marion, Ohio
Ohio Power Shovel Co., Lima, Ohio
Speeder Machy. Corp., Cedar Rapids, Iowa
Trow Shovel Co., Lorain, Ohio

Shovels, Electric

*Bay City Shovels, Inc., Bay City, Mich.
*General Excavator Co., Marion, Ohio
*Osgood Co., Marion, Ohio
American Hoist & Derrick Co., St. Paul
Bucyrus-Erie Co., So. Milwaukee, Wis.
Buckeye Traction Ditcher Co., Findlay, Ohio
Harnischfeger Corp., Milwaukee, Wis.
Industrial Brownhoist Corp., Cleveland, Ohio
Koehring Co., Milwaukee, Wis.
Link-Belt Co., Chicago
Manitowoc Engg. Works, Manitowoc, Wis.
Marion Steam Shovel Works, Marion, Ohio
Mead-Morrison Mfg. Co., Boston, Mass.
Northwest Engineering Co., Chicago
Ohio Power Shovel Co., Lima, Ohio
Speeder Machy. Corp., Cedar Rapids, Iowa
Trow Shovel Co., Lorain, Ohio

Shovels, Gasoline

*Bay City Shovels, Inc., Bay City, Mich.
*General Excavator Co., Marion, Ohio
*Keystone Driller Co., Beaver Falls, Pa.
*Ohio Locomotive Crane Co., Bucyrus, Ohio
*Osgood Co., Marion, Ohio
*Trackson Co., Milwaukee, Wis.
American Hoist & Derrick Co., St. Paul
Buckeye Traction Ditcher Co., Findlay, Ohio
Bucyrus-Erie Co., So. Milwaukee, Wis.
Byers Machine Co., Ravenna, Ohio
Harnischfeger Corp., Milwaukee, Wis.
Industrial Brownhoist Corp., Cleveland, Ohio
Inaley Mfg. Co., Indianapolis, Ind.
Koehring Co., Milwaukee, Wis.
Link-Belt Co., Chicago
Manitowoc Engg. Works, Manitowoc, Wis.
Marion Steam Shovel Co., Marion, Ohio
Mead-Morrison Mfg. Co., Boston, Mass.
Northwest Engg. Co., Chicago
Ohio Power Shovel Co., Lima, Ohio
Speeder Machy. Corp., Cedar Rapids, Iowa
Star Drilling Machine Co., Akron, Ohio
Trow Shovel Co., Lorain, Ohio
Universal Power Shovel Co., Milwaukee, Wis.

Shovels, Spades and Scoops, Hand

American Mfg. Co., Chattanooga, Tenn.
Amer-Baldwin-Wyoming Shovel Co., North
Easton, Mass.
Baldwin Tool Works, Parkersburg, W. Va.
Bell Bros., Alton, Ill.
Conneaut Shovel Co., Conneaut, Ohio
Indiana Shovel Co., New Castle, Ind.
Jackson Shovel Co., Montpelier, Ind.
Wood Shovel & Tool Co., Piqua, Ohio

Shovels, Steam

*Keystone Driller Co., Beaver Falls, Pa.
*Osgood Co., Marion, Ohio
American Hoist & Derrick Co., St. Paul
Bucyrus-Erie Co., So. Milwaukee, Wis.
Industrial Brownhoist Corp., Cleveland, O.
Marion Steam Shovel Co., Marion, Ohio
Orton Crane & Shovel Co., Chicago
Trow Shovel Co., Lorain, Ohio

Shovels, Tractor-Mounted

*Austin-Western Road Machy. Co., Chicago
*Bay City Shovels, Inc., Bay City, Mich.
*Michigan Power Shovel Co., Benton Harbor, Mich.
*Trackson Co., Milwaukee, Wis.
Blair Mfg. Co., W. M., Chicago
Clark Tractor Corp., Battle Creek, Mich.
Miami Trailer-Scrapers Co., Troy, Ohio
Nordberg Mfg. Co., Milwaukee, Wis.
Resistor Engg. Corp., Muskogee, Okla.

Sidewalk Forms (See Forms)

Silicates of Soda

Grasselli Chemical Co., Cleveland, Ohio
Philadelphia Quartz Co., Philadelphia
Standard Silicate Co., Cincinnati, Ohio

Snow Fence (See Fence)

Snow Plow Blades (See Blades)

Snow Removal Machinery (See also Graders, Tractors and Trucks)

*Burch Corp., The, Crestline, Ohio
*La-Plante-Cheate Mfg. Co., Inc., Cedar Rapids, Iowa

Nelson Iron Works, N. P., Passaic, N. J.

Barker Mfg. Co., Springfield, Ill.
Barber-Green Co., Aurora, Ill.

Batavia Steel Plate Const. Co., Batavia, N. Y.

Clark Tractor Corp., Battle Creek, Mich.
Detroit Harvester Co., Detroit, Mich.

Emrie Plow Co., Cleveland, Ohio

Fox Rotary Snow Broom Co., New York

Frink, Carl H., Clayton, Thousand Is., N. Y.

Good Roads Machy. Co., Kennett Square, Pa.

Hains Mfg. Co., Geo., New York

Holl Co., The, Milwaukee, Wis.

Klauser Mfg. Co., Dubuque, Iowa

Maine Steel Prod. Co., So. Portland, Maine

Rotary Snow Plow Co., Minneapolis, Minn.

Wish's Holyoke St. Bl. Wk., Holyoke, Mass.

Walter Motor Truck Co., L. I., N. Y.

Wauau Iron Works, Wauau, Wis.

Western Wheeled Scraper Co., Aurora, Ill.

Spaders, Pneumatic (See Tools, Pneumatic)

Spades (See Shovels)

Spiral Pipe (See Pipe)

Sprayers, Asphalt and Tar, Hand

*Chausse Oil Burner Co., Elkhart, Ind.

Connery & Co., Inc., Philadelphia

*Littleford Bros., Cincinnati, Ohio

Aeroil Burner Co., West New York, N. J.

Kinney Mfg. Co., Boston, Mass.

Mohawk Asphalt Heater Co., Schenectady, N. Y.

Spears-Well Mchy. Co., Oakland, Calif.

Sprayers, Asphalt Emulsion, Hand and Power

*Littleford Bros., Cincinnati, Ohio

Barber Asphalt Co., Philadelphia

Coias Roads, Inc., Boston

Hauck Mfg. Co., Brooklyn, N. Y.

Sacramento Engg. & Mach. Works, Sacramento, Calif.

Tarrant Mfg. Co., Saratoga Springs, N. Y.

Spray Painting Machinery (See Painting Machinery)

Spreaders, Asphalt

*Burch Corp., Crestline, Ohio

Spreaders, Calcium Chloride

*Solvay Sales Corp., New York

Spreaders, Sand and Chip

*Hvass & Co., Inc., Chas., New York

France Foundry & Machine Co., N. Hamilton, Ohio

Good Roads Machy. Co., Kennett Square, Pa.

Goroco Mechanical Spreader Co., Philadelphia

Highway Service, Inc., New Bedford, Mass.

Tarrant Mfg. Co., Saratoga Springs, N. Y.

Universal Road Machy. Co., Kingston, N. Y.

Warren Bros. Co., Boston, Mass.

Spreaders, Stone

*Austin-Western Road Machy. Co., Chicago

Burch Corp., The, Crestline, Ohio

*Hvass & Co., Inc., Chas., New York

Galion Iron Works & Mfg. Co., Galion, Ohio

Goroco Mechanical Spreader Co., Philadelphia

Highway Service, Inc., New Bedford, Mass.

Merriman Asphalt Plant, Inc., Lima, Ohio

Universal Road Machy. Co., Kingston, N. Y.

Stacks, Steel (See Chimneys)

Starting Systems (See Ignition Systems)

Steam Shovels (See Shovels)

Steel, Drill, Hollow

Paragon Stl. & Tool Co., E. Rutherford, N. J.

S & K F Steels, Inc., New York

Swedish-American Steel Corp., Brooklyn, N. Y.

United Alloy Steel Corp., Canton, Ohio
Vulcan Tool Mfg. Co., Quincy, Mass.

Steel, Reinforcing, for Concrete

*Truscon Steel Co., Youngstown, Ohio

Carnegie Steel Co., Pittsburgh, Pa.

Concrete Steel Co., New York

Laclede Steel Co., St. Louis, Mo.

Milton Mfg. Co., Milton, Pa.

Ryerson & Son, Inc., Jos. T. Chicago

Steel, Structural

*Blaw-Knox Co., Pittsburgh, Pa.

American Bridge Co., New York

Bellefontaine Br. & Stl. Co., Bellefontaine, O.

Bethlehem Steel Co., Bethlehem, Pa.

Carnegie Steel Co., Pittsburgh, Pa.

Central States Br. Co., Indianapolis, Ind.

Champion Bridge Co., Wilmington, Ohio

Clinton Bridge Works, Clinton, Iowa

Eastern Bridge & Struc. Co., Worcester, Mass.

Fort Pitt Bridge Works, Pittsburgh, Pa.

Ingalls Iron Works Co., Birmingham, Ala.

Inter. Steel & Iron Co., Evansville, Ind.

Lakeside Bridge & Steel Co., Louisville, Ky.

McClintic-Marshall Co., Pittsburgh, Pa.

Milwaukee Bridge Co., Milwaukee, Wis.

Minneapolis-Moline Power Imp. Co., Minn.

Missouri V. Br. & Ir. Co., Leavenworth, Kans.

Mt. Vernon Bridge Co., Mt. Vernon, Ohio

Ohio Struc. Steel Co., Newton Falls, Ohio

Penn Bridge Co., Beaver Falls, Pa.

Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.

Richmond Struc. Steel Co., Richmond, Va.

Ryerson & Son, Inc., Jos. T. Chicago

Virginia Br. & Iron Co., Roanoke, Va.

Wheeling Struc. Steel Co., Wheeling, W. Va.

Wisconsin Bridge & Iron Co., No. Milwaukee, Wis.

Steel Buildings (See Buildings)

Steel Castings (See Castings)

Steel Chimneys (See Chimneys)

Steel Derricks (See Derricks)

Steel Pipe (See Pipe)

Steel Products, Manganese

*Riddell Co., W. A., Bucyrus, Ohio

American Manganese Steel Co., Inc., Chicago Hts., Ill.

Republic Steel Corp., Youngstown, Ohio

Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Steel Sheet Piling (See Piling)

Steel Tanks (See Tanks)

Stiffleg Derricks (See Derricks)

Stone Spreaders (See Spreaders)

Storage Bins (See Bins)

Straightedges

*Heitzel Steel Form & Iron Co., Warren, O.

Lakewood Engg. Co., Columbus, Ohio

Cleveland Formgrader Co., The, Cleveland, O.

Street Castings (See Castings)

Structural Steel (See Steel)

Stump Pullers (See Pullers)

Subgraders

*Blaw-Knox Co., Pittsburgh, Pa.

*Heitzel Steel Form & Iron Co., Warren, O.

Lakewood Engg. Co., Columbus, Ohio

Cleveland Formgrader Co., The, Cleveland, O.

Hug Co., The, Highland, Ill.

Koehring Co., Milwaukee, Wis.

Surface Heaters, Asphalt (See Heaters)

Surfacing and Grinders, Concrete

*Concrete Surfacing Machy. Co., Cincinnati, O.

*Tossey Tool Co., Cleveland, Ohio

Chicago Pneumatic Tool Co., New York

Cleveland Pneu. Tool Co., Cleveland, O.

Dallett Co., The, Philadelphia, Pa.

Ingersoll-Rand Co., New York

Surveying Instruments (See Instruments)

Tamps, Pneumatic (See Tools, Pneumatic)

Tanks, Air Compressor

*Connery & Co., Inc., Philadelphia

*Littleford Bros., Cincinnati, Ohio

*Schramm, Inc., West Chester, Pa.

*Worthington Pump & Machy. Corp., Harrison, N. J.

Bigg Boiler Works, Akron, Ohio

Chicago Bridge & Iron Works, Chicago

Chicago Pneumatic Tool Co., New York

Graver Tank & Mfg. Co., East Chicago, Ind.

Heil Co., Milwaukee, Wis.

Ingersoll-Rand Co., New York

Lancaster Iron Works, Lancaster, Pa.

National Tube Co., Pittsburgh, Pa.

Petroleum Iron Works Co., Sharon, Pa.

Pittsburgh-Des Moines Steel Co., Pittsburgh

Scaife & Sons, W. B., Pittsburgh, Pa.

Stover Steel Tank & Mfg. Co., Freeport, Ill.

Westinghouse Trac. Brake Co., Wilmerding, Pa.

Youngstown Br. & Tank Co., Youngstown, O.

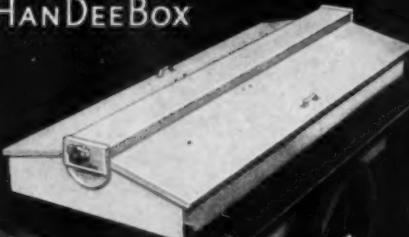
*IF you are a Contractor
or a Highway Engineer . . .
YOU should have a copy
of this BULLETIN*

If it is necessary for you to have tools and equipment moved often from one place to another, this bulletin will be of interest to you. It tells about the HanDeeBox, an all-steel tool box in which are combined new ideas in design and construction that you'll find mighty interesting. Write for the Bulletin. You'll be under no obligation.

NOTE: This coming January the HanDeeBox will be shown at the American Road Builders Association Road Show at Detroit



THE LB
HANDEEBOX



The HanDeeBox, a fine looking tool box with an arrangement of compartments and shelves to take care of the most complicated collection of tools and equipment. It is of All Steel Construction—much stronger than a wooden box, but lighter in weight. Double covers lock simultaneously . . . front and rear stiff legs fasten in position from inside; both wheels lock to box; lantern guards give plenty of light and lots of protection. The outfit is Timken bearing equipped; it is made for high speed trailing.

BULLETIN NO. 64
Showing Littleford All Steel Tool Boxes, Steel Storage House, Steel Portable Anchors, Rollers, and Trailers.

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Cincinnati, Ohio

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**CONWEIGH CONVEYORS building Queens
Anchorage of TRI-BOROUGH BRIDGE, N. Y. C.**

Here are shown the two CONWEIGH CONVEYORS which are "putting in good licks" at the Queens Borough anchorage of New York City's big Tri-borough Bridge over the East River.

The initial conveyor—a 26-inch belt 240 feet long—carries aggregate from a large dump hopper up an 18-degree incline to an elevation of 27 feet, delivering 300 tons per hour at a speed of 375 feet per minute.

The second conveyor—a 26-inch belt 310 feet long—runs up a 15-degree incline leading to the batching plant hoppers, and has a carrying capacity of 350 tons per hour of

either sand or gravel, with a speed of 415 feet per minute.

These same two conveyors were in service three years ago for a period of six months in the construction of the New York anchorage of the recently opened George Washington Bridge over the Hudson River, during which time a total of 220,000 tons of sand, gravel and cement was handled.

Let us send you further details showing how a CONWEIGH CONVEYOR might "put in some good licks" for YOU.

CONVEYING WEIGHER COMPANY
NINETY WEST STREET

NEW YORK CITY



* * * * WHERE TO PURCHASE * * *

Tanks, Gasoline Storage

Beatrice Stl. Tank Mfg. Co., Beatrice, Neb.
Biggs Boiler Works, Akron, Ohio
Birmingham Tank Co., Birmingham, Ala.
Bower & Co., Inc., S. F. Ft. Wayne, Ind.
Borham Boiler Corp., Irvington, N. Y.
Caldwell Co., W. E. Louisville, Ky.
Chicago Bridge & Iron Works, Chicago
Columbian Steel Tank Co., Kansas City, Mo.
Graver Tank & Mfg. Co., East Chicago, Ind.
Heil Co., Milwaukee, Wis.
Lancaster Iron Works, Inc., Lancaster, Pa.
Petroleum Iron Works Co., Sharon, Pa.
Pittsburgh-Des Moines Steel Co., Pittsburgh
Road Supply & Metal Co., Topeka, Kans.
Tokheim Oil Tank & Pump Co., Ft. Wayne, Ind.
Wayne Co., Ft. Wayne, Ind.

Tanks, Steel

Connery & Co., Philadelphia
Honhorst Co., Jos., Cincinnati, O.
Littleford Bros., Cincinnati, Ohio
Beatrice Steel Tank Mfg. Co., Beatrice, Neb.
Biggs Boiler Works, Akron, Ohio
Birmingham Tank Co., Birmingham, Ala.
Bower & Co., Inc., S. F. Ft. Wayne, Ind.
Burnham Boiler Corp., Irvington, N. Y.
Butler Mfg. Co., Minneapolis, Minn.
Caldwell Co., W. E. Louisville, Ky.
Chattanooga Br. & Tk. Co., Chattanooga
Chicago Bridge & Iron Works, Chicago
Cole Mfg. Co., R. D. Newnan, Ga.
Columbian Steel Tank Co., Kansas City, Mo.
Dover Boiler Works, New York
Edwards Mfg. Co., Cincinnati, Ohio
Farrell Mfg. Co., Joliet, Ill.
Graver Tank & Mfg. Co., E. Chicago, Ind.
Hardesty Mfg. Co., R., Denver, Colo.
Hell Co., Milwaukee, Wis.
Hendrick Mfg. Co., Carbondale, Pa.
Lancaster Iron Works, Lancaster, Pa.
McClintic-Marshall Co., Pittsburgh, Pa.
N. Y. Central Ir. Wks. Co., Hagerstown, Md.
Petroleum Iron Works Co., Sharon, Pa.
Pittsburgh-Des Moines Steel Co., Pittsburgh
Road Supply & Metal Co., Topeka, Kansas
Sealife & Sons, W. B., Pittsburgh, Pa.
United Iron Works, Inc., Kansas City, Mo.
Youngstown Boiler & Tank Co., Youngstown, O.

Tanks, Wood

Acme Tank Co., New York
Beatrice Steel Tank Mfg. Co., Beatrice, Neb.
Caldwell Co., W. E., Louisville, Ky.
Davis & Son, G. M., Palatka, Fla.
Eagle Tank Co., Chicago
Hauser-Stander Tank Co., Cincinnati, Ohio
Kalamazoo Tank & Silo Co., Kalamazoo, Mich.
National Tk. & Pipe Co., Portland, Ore.
Pacific Tank & Pipe Co., San Francisco, Calif.
Redwood Mfrs. Co., San Francisco, Calif.
Stearns Lumber Co., A. T., Boston, Mass.
U. S. Wind Eng. & Pump Co., Batavia, Ill.
Wendnagel & Co., Chicago

Tapes, Steel and Cloth

Dietzgen Co., Eugene, New York
Keuffel & Esser Co., Hoboken, N. J.
Lufkin Rule Company, Saginaw, Mich.
Starrett Co., The L. S., Athol, Mass.

Tar

Barrett Co., New York
Koppers Products Co., Pittsburgh, Pa.

Tarpaulin

Canvas Products Co., St. Louis, Mo.
Daniels, Inc., U. R., New York
Fulton Bag & Cotton Mills, Atlanta, Ga.
Goss Co., J. C., Detroit, Mich.

Tents

Canvas Products Co., St. Louis, Mo.
Compac Tent Corp., Indianapolis, Ind.
Daniels, Inc., C. R., New York
Meyer & Co., L. M., Springfield, Mass.
Fulton Bag & Cotton Mills, Atlanta, Ga.

Testers, Subgrade

Helszel Steel Form & Iron Co., Warren, O.
Lakewood Engg. Co., Columbus, Ohio

Testing Laboratories (See Directory in this issue)

Thawing Torches (See Torches)

Threaders, Pipe

Armstrong Mfg. Co., Bridgeport, Conn.
Borden Co., Warren, Ohio
Jarecki Mfg. Co., Erie, Pa.
Oster Mfg. Co., Cleveland, Ohio
Toledo Pipe Threading Mach. Co., Toledo, O.
Williams Tool Corp., Cleveland, Ohio

Ties, Bar

Symons Clamp & Mfg. Co., Chicago
Union Steel Products Co., Albion, Mich.

Ties, Form (See Clamps and Ties, Form)

Ties, Steel

Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., Pittsburgh, Pa.
Easton Car & Const. Co., Easton, Pa.
International Steel Tie Co., Cleveland, Ohio
Koppel Ind. Car & Equip. Co., Koppel, Pa.
Sweet's Steel Co., Williamsport, Pa.

Ties, Wall

Berger Mfg. Co., Canton, Ohio
Concrete Steel Co., New York
Consolidated Exp. Metal Co., Wheeling, W. Va.
Donley Bros. Co., Cleveland, Ohio
Evertt & Co., R. B., Houston, Texas
Milwaukee Corr. Co., Milwaukee, Wis.
M. & M. Wire Clamp Co., Minneapolis, Minn.
Reeves Mfg. Co., Dover, Ohio
Wedgit Tie Co., Inc., New York

Tile, Drainage

American Vitrified Prod. Co., Akron, Ohio
Dee Co., Wm. E., Chicago, Ill.
Dickey Mfg. Co., W. S., Kansas City, Mo.
Evens & Howard Fire Brick Co., St. Louis
Minnesota Pipe & Tile Co., Mankato, Minn.
National Drain Tile Co., Terre Haute, Ind.

Tires, Rubber

Dunlap Tire & Rub. Corp. of Amer., Buffalo, N. Y.
Firestone Tire & Rubber Co., Akron, O.
Fisk Tire Co., Chicago Falls, Mass.
General Tire & Rubber Co., Akron, Ohio
Goodrich Rubber Co., B. F., Akron, Ohio
Goodyear Tire & Rubber Co., Akron, Ohio
Hood Rubber Prod. Co., Inc., Watertown, Mass.
Kelly-Springfield Tire Co., New York
U. S. Tire Co., New York

Tool Houses (See Buildings)

Tools (See various classifications, such as Branding Tools, etc.)

Tools, Pneumatic

Hardsocg Wonder Drill Co., Ottumwa, Iowa
Independent Pneu. Tool Co., Chicago
McKiernan-Terry Corp., New York
Schramm, Inc., West Chester, Pa.
Tousley Tool Co., Cleveland, Ohio
Buhl Co., The, Chicago
Chicago Pneumatic Tool Co., New York
Cleveland Pneumatic Tool Co., Cleveland, O.
Dayton Pneumatic Tool Co., Dayton, Ohio
Gardner-Denver Co., Quincy, Ill.
Gilman Mfg. Co., E. Boston, Mass.
Helwig Mfg. Co., St. Paul, Minn.
Ingersoll-Rand Co., New York
Keller, Inc., Wm. H., Grand Haven, Mich.
Sullivan Machinery Co., Chicago

Torches, Blow

American Steel Works, Kansas City, Mo.
Everhot Mfg. Co., Maywood, Ill.
Hauck Mfg. Co., Brooklyn, N. Y.
Milburn Co., Alexander, Baltimore, Md.
Prest-O-Lite Co., Inc., New York
Williams Co., G. H., Erie, Pa.

Torches, Cutting and Welding (See Welding Apparatus)

Torches, Thawing and Heating

Chauase Oil Burner Co., Elkhart, Ind.
Connery & Co., Philadelphia
Littleford Bros., Cincinnati, Ohio
Aeroil Burner Co., West New York, N. J.
American Steel Works, Kansas City, Mo.
Hauck Mfg. Co., Brooklyn, N. Y.
Macleod Co., Cincinnati, Ohio
Mohawk Asph. Heater Co., Schenectady, N. Y.

Torches, Warning

Consolidated Ir.-St. Mfg. Co., Cleveland, O.
Toledo Pressed Steel Co., Toledo, Ohio

Tower Hoists (See Hoists)

Towers, Concrete Placing (See Chutes and Towers)

Tracks, Industrial and Portable

Lakewood Engg. Co., Columbus, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., Carnegie, Pa.
Easton Car & Const. Co., Easton, Pa.
Gregg Co., Ltd., Hackensack, N. J.
Hunt Co., Inc., C. W. W. New Brighton, N. Y.
Insley Mfg. Co., Indianapolis, Ind.
Koppel Ind. Car & Equip. Co., Koppel, Pa.
Sweet's Steel Co., Williamsport, Pa.
St. Louis Frog & Switch Co., St. Louis, Mo.

Traction Treads (See Treads)

Tractor Hitches (See Hitches)

Tractor Shovels (See Shovels)

Tractors

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Caterpillar Tractor Co., Peoria, Ill.
Cleveland Tractor Co., Cleveland, Ohio
International Harvester Co., Chicago
Case Co., J. I., Racine, Wis.
Clark Tractor Co., Battle Creek, Mich.
Foote Bros. Gear & Machine Co., Chicago
Linn Mfg. Co., Morris, N. Y.
Lombard Tractor & Truck Corp., New York
Mead-Morrison Mfg. Co., E. Boston, Mass.
Minneapolis-Moline Power Impl. Co., Minn.
National Brake & Elec. Co., Milwaukee, Wis.
Sterling Tractor Equip. Co., Brooklyn, N. Y.
Yuba Mfg. Co., San Francisco, Calif.

Trailers and Semi-Trailers

Bay City Shovels, Inc., Bay City, Mich.
Hvass & Co., Inc., Chas., New York
La-Plante-Choate Mfg. Co., Inc., Cedar Rapids, Iowa
Rogers Bros. Corp., Albion, Pa.
Schaefer Corp., Gustav, Cleveland, Ohio
Clark Tractor Co., Battle Creek, Mich.
Detroit Trailer & Mach. Co., Detroit, Mich.
Eagle Wagon Works, Auburn, N. Y.
Easton Car & Const. Co., Easton, Pa.
Electric Wheel Co., Quincy, Ill.
Fruehauf Trailer Co., Detroit, Mich.
Highway Trailer Co., Edgerton, Wis.
Imperial Machine Co., Minneapolis, Minn.
Miami Trailer-Scraper Co., Troy, Ohio
Muskogee Iron Works, Muskogee, Okla.
Rex-Watson Corp., Canastota, N. Y.
Streich & Bros. Co., A., Oshkosh, Wis.
Trailmobile Co., Cincinnati, Ohio
Troy Trailer & Wagon Co., Troy, Ohio
Whitehead & Kales Co., Detroit, Mich.
Williams Co., G. H., Erie, Pa.
Winsor Tractor Equip. Corp., Ann Arbor, Mich.

Trailers, Heavy Machinery

Bay City Shovels, Inc., Bay City, Mich.
Hvass & Co., Inc., Chas., New York
Rogers Bros. Corp., Albion, Pa.
Acme Road Machy. Co., Frankfort, N. Y.
Arcadia Trailer Corp., Newark, N. J.
Electric Wheel Co., Quincy, Ill.
Highway Trailer Co., Edgerton, Wis.
Miami Trailer-Scraper Co., Troy, Ohio
Williams Co., G. H., Erie, Pa.
Winsor Tractor Equip. Corp., Ann Arbor, Mich.

Tremies, Aerial

American Steel & Wire Co., Chicago
Williamsport Wire Rope Co., Chicago
Bedford Fdy. & Machine Co., Bedford, Ind.
Leschen & Sons Rope Co., A., St. Louis, Mo.

Transformers, Electric

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Brown Boveri Elec. Corp., Canada, N. J.
Duncan Elec. Mfg. Co., Lafayette, Ind.
General Electric Co., Schenectady, N. Y.
Kuhiman Electric Co., Bay City, Mich.
Sangamo Electric Co., Springfield, Ill.
Wagner Electric Corp., St. Louis, Mo.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh

Treads, Crawler

Jaeger Machine Co., Columbus, Ohio
Moon Track Co., Chicago
Riddell Co., W. A., Bucyrus, Ohio
Trackson Co., Milwaukee, Wis.
American Manganese Steel Co., Chicago Hts., Ill.
Electric Wheel Co., Quincy, Ill.
Peerless Track Co., St. Joseph, Mich.
Rex-Watson Corp., Canastota, N. Y.
Truck Corp., Newark, N. J.
Wehr Co., Milwaukee, Wis.

Trench Braces (See Braces)

French Excavators (See Excavators and also Shovels)

Trench Pumps (See Pumps)

French Rollers (See Rollers)

Triplex Pumps (See Pumps)

Truck Bodies, Concrete (See Bodies)

Truck Cranes (See Cranes)

Trucks, Cement Bag

American Pulley Co., Philadelphia
Anchor Post Fence Co., Baltimore, Md.
Case Crane & Eng. Co., Columbus, Ohio
Clark Co., Geo. F., Windsor Locks, Conn.
Electric Wheel Co., Quincy, Ill.
Fairbanks Co., New York

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A SUPER OIL, TAR and ASPHALT DISTRIBUTOR



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“ETNYRE MODEL F”

Designed and built to maintain and produce the best kind of BITUMINOUS ROADS
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This is an actual photograph of an “ETNYRE MODEL F” applying 7/10 gallons per square yard, asphalt heated to 340 degrees F. with 18' spray bars on the Sanford-Orlando Road No. 3 in Florida. This is a splendid example of

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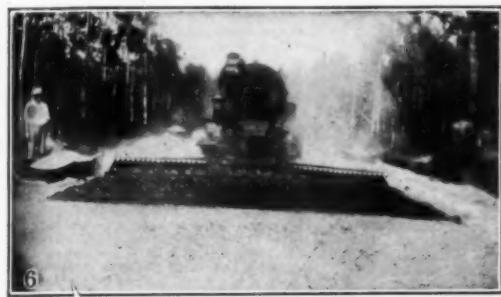
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Let us send you bulletin No. 503 giving specifications and more interesting facts.

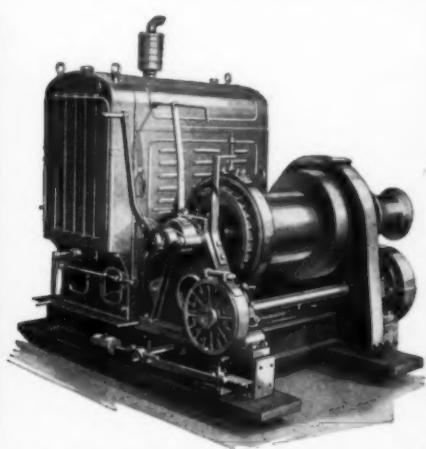
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Powerful Motor—Rugged Frame
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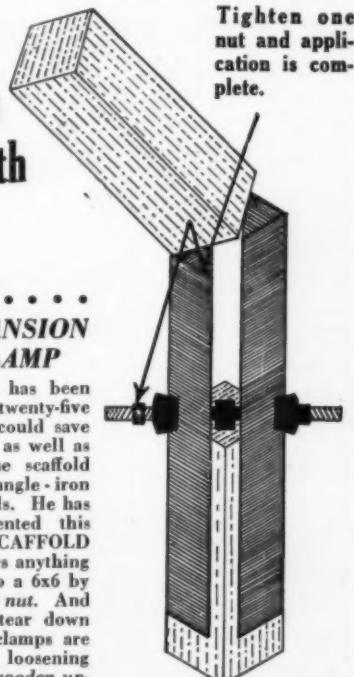
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HOIST AND DERRICK HEADQUARTERS
ELIZABETH, N. J.

22 Times
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*The New EXPANSION
SCAFFOLD CLAMP*

A contractor who has been building scaffolds for twenty-five years found that he could save a great deal of time, as well as avoid damage to the scaffold timbers, by using angle-iron clamps instead of nails. He has developed and patented this EXPANSION SCAFFOLD CLAMP, which splices anything from a 3x3 upright to a 6x6 by simply *tightening one nut*. And when it is time to tear down the scaffolding, the clamps are easily removed by loosening one nut, leaving the wooden uprights clean and undamaged. Let us send you our illustrated circular.



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EXPANSION SCAFFOLD CLAMP CO.
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FLUSHING, N. Y.

- - - WHERE TO PURCHASE - - -

Trucks, Motor

- *Dodge Bros. Corp., Detroit, Mich.
- *International Harvester Co., Chicago
- Acme Motor Truck Co., Cadillac, Mich.
- Atterbury Motor Car Co., Buffalo, N. Y.
- Autocar Co., Ardmore, Pa.
- Brockway Motor Truck Co., Cortland, N. Y.
- Chevrolet Motor Co., Flint, Mich.
- Clydesdale Motor Truck Co., Clyde, Ohio
- Diamond T Motor Car Co., Chicago
- Duplex Truck Co., Lansing, Mich.
- Fageol Motors Co., Detroit, Mich.
- Federal Motor Truck Co., Detroit, Mich.
- Ford Motor Co., Detroit, Mich.
- Four Wheel Drive Auto Co., Clintonville, Wis.
- Freeman Motor Co., Detroit, Mich.
- General Motors Truck Co., Pontiac, Mich.
- Gramm Motors, Inc., Lima, Ohio
- Griswold Powermatic Corp., Ohio
- Hug Co., The, Highland, Ill.
- Indiana Truck Corp., Marion, Ind.
- La France-Republic Sales Corp., New York
- Larabee-Deyo Motor Truck Co., Binghamton, N. Y.
- Luedinghaus-Espenschied Wagon Co., St. Louis
- Maccar Truck Co., Scranton, Pa.
- Mack Trucks, Inc., New York
- Moreland Motor Truck Co., Los Angeles, Calif.
- Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis.
- Pierce-Arrow Motor Car Co., Buffalo, N. Y.
- Reeberger & Son, Newark, N. J.
- Relay Motors Corp., Lima, Ohio
- Reo Motor Car Co., Lansing, Mich.
- Schacht Motor Truck Co., Cincinnati, Ohio
- Selden Truck Corp., Rochester, N. Y.
- Standard Motor Truck Co., Detroit, Mich.
- Sterling Motor Truck Co., Milwaukee
- Stewart Motor Corp., Buffalo, N. Y.
- Studebaker Corp., South Bend, Ind.
- Titan Truck Service Co., Milwaukee, Wis.
- Traffic Motor Truck Co., St. Louis, Mo.
- Walter Motor Truck Co., Long Is. City, N. Y.
- White Co., The, Cleveland, Ohio

Turntables, Motor Truck

- *Blaw-Knox Co., Pittsburgh, Pa.
- Canton Fdy. & Mach. Co., Canton, Ohio
- Champion Engine Co., Kenton, Ohio
- Easton Car & Const. Co., Easton, Pa.
- Freeman Mfg. Co., Racine, Wis.
- Hug Co., Highland, Ill.
- Western Structural Co., Moline, Ill.
- Whiting Corp., Harvey, Ill.

Underground Conduits (See Conduits)

Unloaders, Car

- *Burch Corp., Crestline, Ohio
- *Holtzel Steel Form & Iron Co., Warren, Ohio
- Atlas Engg. Co., Clintonville, Wis.
- Farquhar Corp., Ltd., A. B., York, Pa.
- Hains Mfg. Co., Gen., New York
- Northern Conveyor Co., Janesville, Wis.
- Webster & Weller Mfg. Co., Chicago

Valves, Check

- Chapman Valve Mfg. Co., Indian Orch., Mass.
- Conn Valve Co., Boston, Mass.
- Cook, Inc., A. D., Lawrenceburg, Ind.
- Darling Valve Mfg. Co., Williamsport, Pa.
- Kennedy Valve Mfg. Co., Elmira, N. Y.
- Ludlow Valve Mfg. Co., Troy, Ohio
- Michigan Valve & Fdy. Co., Detroit, Mich.
- Rensselaer Valve Co., Troy, N. Y.

Valves, Gasoline Engine

- Industrial Engine Parts Co., Inc., Cleveland

Valves, Relief

- *Neptune Meter Co., New York
- Crane Co., Chicago, Ill.
- Davis Regulator Co., Chicago
- Eddy Valve Co., Waterford, N. Y.
- Golden-Anderson Valve Spec. Co., Pittsburgh
- Ludlow Valve Mfg. Co., Troy, N. Y.
- Mueller Co., Decatur, Ill.
- Ross Valve Mfg. Troy, N. Y.
- Simplex Valve & Meter Co., Philadelphia

Vibrators, Concrete

- Elec. Tamper & Equip. Co., Chicago

Wagons, Dump, Horse-Drawn

- *Austin-Western Rd. Machy. Co., Chicago
- *Evans & Co., Inc., Chas., New York
- Acme Road Machy. Co., Frankfort, N. Y.
- Acme Wagon Co., Emigsville, Pa.
- Adams Co., J. D., Indianapolis, Ind.
- Eagle Wagon Works, Auburn, N. Y.
- Holzberg & Bro., G. H., Jeffersonville, Ind.
- Highway Trailer Co., Edgerton, Wis.
- Luedinghaus-Espenschied Wagon Co., St. Louis
- Streich & Bro. Co., A., Oshkosh, Wis.
- Stroud Rd. Machy. Co., Omaha, Neb.
- Troy Trailer & Wagon Co., Troy, Ohio
- Western Wheeled Scraper Co., Aurora, Ill.

Wagons, Dump, Tractor-Drawn

- *Egulid Road Machy. Co., Cleveland, Ohio
- *La-Plante-Cheste Mfg. Co., Inc., Cedar Rapids, Iowa
- *Trackson Co., Milwaukee, Wis.

- Acme Road Machy. Co., Frankfort, N. Y.
- Athey Truss Wheel Co., Chicago
- Biehl Iron Works, Reading, Pa.
- Davenport Loco. & Mfg. Corp., Davenport, Iowa
- Eagle Wagon Works, Auburn, N. Y.
- Electric Wheel Co., Quincy, Ill.
- Lenhart Wagon Co., Minneapolis, Minn.
- LeTourneau, R. G., Stockton, Calif.
- Smith Trailer Corp., Syracuse, N. Y.
- Streich & Bro. Co., A., Oshkosh, Wis.
- Trail-iT Co., St. Paul, Minn.
- Troy Trailer & Wagon Co., Troy, Ohio
- Western Wheeled Scraper Co., Aurora, Ill.
- Winsor Tractor Equip. Corp., Ann Arbor, Mich.

Wall Ties (See Ties)

Washers, Sand and Gravel

- *Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- *Pioneer Gravel Equip. Mfg. Co., Minneapolis.
- Diamond Iron Works, Minneapolis, Minn.
- Good Roads Machy. Co., Kennett Square, Pa.
- Iowa Mfg. Co., Cedar Rapids, Iowa
- Jeffreys Mfg. Co., Columbus, Ohio
- Link-Belt Co., Chicago, Ill.
- New England Road Machy. Co., South Boston, Mass.
- New Holland Machine Co., New Holland, Pa.
- Rogers Iron Wks. Co., Joplin, Mo.
- Smith Engineering Works, Milwaukee, Wis.
- Stephens-Adamson Mfg. Co., Aurora, Ill.
- Traylor Engg. & Mfg. Co., Allentown, Pa.
- Universal Rd. Machy. Co., Kingston, N. Y.
- Weimer Co., H. W., Milwaukee, Wis.

Water Hose Couplings (See Couplings)

Waterproofing

- *Aqua-Pruf, Inc., New York
- *Carey Co., Philip, Cincinnati, Ohio
- *Meadows, Inc., W. E., Streator, Ill.
- *Servicized Products Corp., Chicago
- American Sika Corp., New York
- Anti-Hydro Waterproofing Co., Newark, N. J.
- Atlas Mineral Prod. Co., Mertztown, Pa.
- Barber Asphalt Co., Philadelphia
- Barrett Co., New York
- Bitutect, Inc., Los Angeles, Calif.
- Headley Emulsified Prod. Co., Philadelphia
- Johns-Manville Co., New York
- Lehman Co., Chicago
- Master Builders Co., Cleveland, Ohio
- Medusa Portland Cement Co., Cleveland, Ohio
- Minwax Co., New York
- Ruberoid Co., New York
- Sonneborn Sons, Inc., L., New York
- Super Concrete Emulsions Ltd., Pittsburgh, Pa.
- Texas Co., The, New York
- Toch Brothers, New York
- Truscon Laboratories, Detroit, Mich.
- Western Elaterite Roofing Co., Denver, Colo.

Welding Apparatus, Acetylene

- Imperial Brass Mfg. Co., Chicago
- Linde Air Products Co., The, New York
- Macleod Co., Cincinnati, Ohio
- Milburn Co., Alex., Baltimore, Md.
- Oxwell Acetylene Co., L. I. City, N. Y.
- Smith Welding Equip. Corp., Minneapolis

Welding Apparatus, Electric

- Acme Electric Welder Co., Los Angeles, Calif.
- Burke Electric Co., Erie, Pa.
- Eisler Electric Corp., Newark, N. J.
- Fusion Welding Corp., Chicago
- General Electric Co., Schenectady, N. Y.
- Klauber Mfg. Co., Dubuque, Iowa
- Lincoln Electric Co., Cleveland, Ohio
- Northwestern Mfg. Co., Milwaukee, Wis.
- Stoody Co., Whittier, Calif.
- Sytron Co., Pittsburgh, Pa.
- U. S. Light & Heat Corp., Niagara Falls, N. Y.
- Westinghouse E. & M. Co., E. Pittsburgh, Pa.

Welding Wires (See Rods)

Well Drills (See Drills)

Well Points

- *Moretrench Corp., Rockaway, N. J.
- Cook, Inc., A. D., Lawrenceburg, Ind.
- Johnson, Inc., E. E., St. Paul, Minn.

Wheelbarrows

- *General Wheelbarrow Co., Cleveland, Ohio
- Acme Road Machinery Co., Frankfort, N. Y.
- American Steel Scraper Co., Sidney, Ohio
- Asheboro Wheelbarrow Co., Asheboro, N. C.
- Case Crane & Eng. Co., Columbus, Ohio
- Chattanooga Wheelbarrow Co., Chattanooga, Tenn.
- Fairbanks Co., New York
- Jackson Mfg. Co., Harrisburg, Pa.
- Lansing Co., Lansing, Mich.
- Puffer-Hubbard Mfg. Co., Minneapolis, Minn.
- Red Star Products Corp., Cleveland, Ohio
- Sidney Steel Scraper Co., Sidney, Ohio
- Sterling Wheelbarrow Co., Milwaukee, Wis.

- Stuebner Iron Wks., Inc., G. L., Long Island City, N. Y.
- Toledo Wheelbarrow Co., Toledo, Ohio

Wheeled Scrapers (See Scrapers)

Wheels, Steel

- Buda Co., Harvey, Ill.
- Electric Wheel Co., Quincy, Ill.
- Fairbanks, Morse & Co., Chicago
- Lansing Co., Lansing, Mich.
- Wehr Co., Cudahy, Wis.
- Whitehead & Kales Co., Detroit, Mich.

Winches

- *Beebe Bros., Inc., Seattle, Wash.
- *Lidgerwood Mfg. Co., Elizabeth, N. J.
- *Sanger Derrick Co., Chicago
- *Schaefer Co., Gustav, Cleveland, Ohio
- Chicago Pneumatic Tool Co., New York
- Chisholm-Moore Hoist Corp., Tonawanda, N. Y.
- Clyde Iron Works Sales Co., Duluth, Minn.
- Dake Engine Co., Grand Haven, Mich.
- Dobbie Fdy. & Mach. Co., Niagara Falls, N. Y.
- Fridy Hoist & Machy. Co., Mountville, Pa.
- Horton Co., John T., New York
- Mead-Morrison Mfg. Co., E. Boston, Mass.
- Mundy Hoisting Eng. Co., J. S., Newark, N. J.
- Muskogee Iron Works, Muskogee, Okla.
- Stephens-Adamson Mfg. Co., Aurora, Ill.
- Street Bros. Mach. Works, Chattanooga, Tenn.
- Sullivan Machinery Co., Chicago
- Thomas Elevator Co., Chicago
- Utility Supply Co., Clintonville, Wis.
- Willamette-Ersted Co., Portland, Ore.

Wire and Cable, Electric

- *American Steel & Wire Co., Chicago
- Anaconda Wire & Cable Co., Pawtucket, R. I.
- Bishop Wire & Cable Corp., New York
- Copperwell Steel Co., Glassport, Pa.
- General Cable Corp., New York
- General Electric Co., Schenectady, N. Y.
- Graybar Electric Co., New York
- Habirshaw Cable & Wire Corp., New York
- Marion Insulated Wire & Rubber Co., Chicago
- New York Insulated Wire Co., New York
- Okonite Co., Passaic, N. J.
- Page Steel & Wire Co., Bridgeport, Conn.
- Reebling's Sons Co., John A., Trenton, N. J.
- Rome Wire Co., Rome, N. Y.
- Simplex Wire & Cable Co., Boston, Mass.
- Standard Underground Cable Co., Pittsburgh
- Wickwire-Spencer Steel Co., New York

Wire Cutters (See Cutters)

Wire Fabric Reinforcing for Concrete

- *American Steel & Wire Co., Chicago
- *Truscon Steel Co., Youngstown, Ohio
- Concrete Engg. Co., Omaha, Neb.
- Consolidated Exp. Metal Co., Wheeling, W. Va.
- Electric Welding Co., Pittsburgh, Pa.
- Kalmus Steel Co., Chicago, Ill.
- National Steel Fabric Co., Pittsburgh, Pa.
- Wheeling Steel Corp., Wheeling, W. Va.
- Wickwire-Spencer Steel Co., New York

Wire Fence (See Fence)

Wire Rope (See Rope)

Wire Rope Clips (See Clips)

Wires, Welding (See Rods)

Wood, Creosoted

- American Creo. Co., Inc., Louisville, Ky.
- American Creo. Wks., Inc., New Orleans, La.
- Ayer & Lord Tie Co., Chicago
- Colonial Creo. Co., Inc., Louisville, Ky.
- Compressed Wood Preser. Co., Cincinnati, Ohio
- Creosoted Materials Co., New Orleans, La.
- Georgia Creo. Co., Louisville, Ky.
- Jennison-Wright Co., Toledo, Ohio
- Long Bell Lumber Co., Kansas City, Mo.
- Midland Creo. Co., Granite City, Ill.
- Pensacola Creo. Co., Pensacola, Fla.
- Republic Creo. Co., Indianapolis, Ind.
- Southern Wood Preserving Co., Atlanta, Ga.
- Wyckoff Pipe & Creos. Co., New York

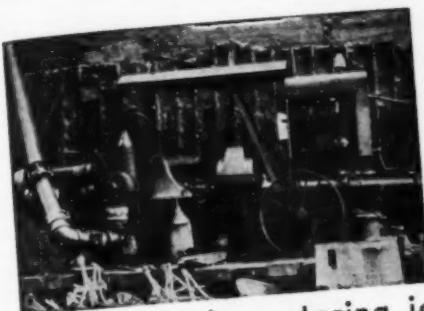
Wood Block Paving (See Block Paving)

Wood Pipe (See Pipe)

Wood Tanks (See Tanks)

Woodworking Machines, Portable

- American Floor Surfacing Mach. Co., Ta.
- Toledo, Ohio
- American Saw Mill Machy. Co., Hackensack, N. J.
- Black Bros. Co., Mendota, Ill.
- Carter Co., R. L., Phoenix, N. Y.
- C. H. & S. Mfg. Co., Milwaukee, Wis.
- Jaeger Portable Power Corp., Detroit, Mich.
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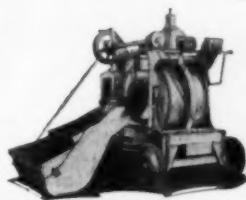
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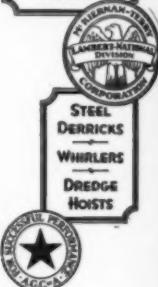
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Culverts of ARMCO Paved Invert PIPE



RESIST
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COST LESS PER YEAR TO MAINTAIN

"Nature's Laboratory" says so. Here, in the test of tests, Armco Paved Invert Pipe has confirmed the results of years of field and laboratory tests. Armco Paved Invert Pipe has proved its ability to withstand the wear of hydraulic traffic.

Where the wear comes, in the bottom, there the protection is—a tough, resilient, bituminous pavement which amply protects the base metal against the "eating away" of sand, silt, stones and even boulders.

This exclusive Armco feature, coupled with the fact that the base metal is Armco Ingot Iron (which has an unequalled record of 25 years for durability to date) makes Armco Paved Invert Pipe a worthwhile investment in any drainage construction, and especially where erosion is a serious problem.

The use of Armco Paved Invert Pipe for culverts and drains is a distinct economy. Paved where the wear comes adds years of trouble-free service to the culvert. Per-year cost drops to the minimum.

Today, the swing is to this more durable type of drainage material. More than 2,500,000 feet is in use, proving the true worth and economy of the paved invert principle and application, as developed by Armco.



Sediment ranging from tiny particles of silt and grit up to sand, gravel and even boulders, grinds and wears away the bottom of the culvert as by countless emery wheels.

Send for a copy of the new booklet on this unusual Armco product. It fully explains the advantages of this erosion-resistant pipe for culverts and drains. Other valuable information is given. Clip and mail the coupon today.

Armco culverts and drains are manufactured from the Armco Ingot Iron of the American Rolling Mill Company and always bear its brand.

Gentlemen: Send new booklet of facts and data on culverts of Armco Paved Invert Pipe.

I AM AN ENGINEER CONTRACTOR ROAD OFFICIAL

NAME

ADDRESS

CEM12

ARMCO CULVERT MANUFACTURERS ASSOCIATION
MIDDLETOWN, OHIO

LAY ARMCO PAVED INVERT PIPE THIS WINTER • KEEP YOUR MEN AT WORK

A black, corrugated flexible hose or pipe, likely made of a material like PVC or rubber, is shown in a close-up, slightly angled view. The hose has a ribbed, flexible texture and is positioned in front of a background of repeating text.

SERVICE IN THE GROUND ACCLAIMS **ARMCO** PAVED INVERT CULVERTS



Under the severest of drainage conditions, Armco Paved Invert Culverts have withstood the incessant grinding and wearing of erosive hydraulic traffic.

Not content to pioneer in producing this improved type of culvert, Armco engineers have carefully watched and checked its performance in actual service.

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ability to re-use, more improvement per dollar spent—these and many others are the advantages offered in culverts of Armco Paved Invert Pipe.

Have before you the latest facts and data before specifying or buying culverts —now in convenient booklet form. Valuable information will be found on every page. This information is yours for the asking. Use coupon on the other side.



A fresh replacement of Armco Paved Invert Pipe on a main-line railroad

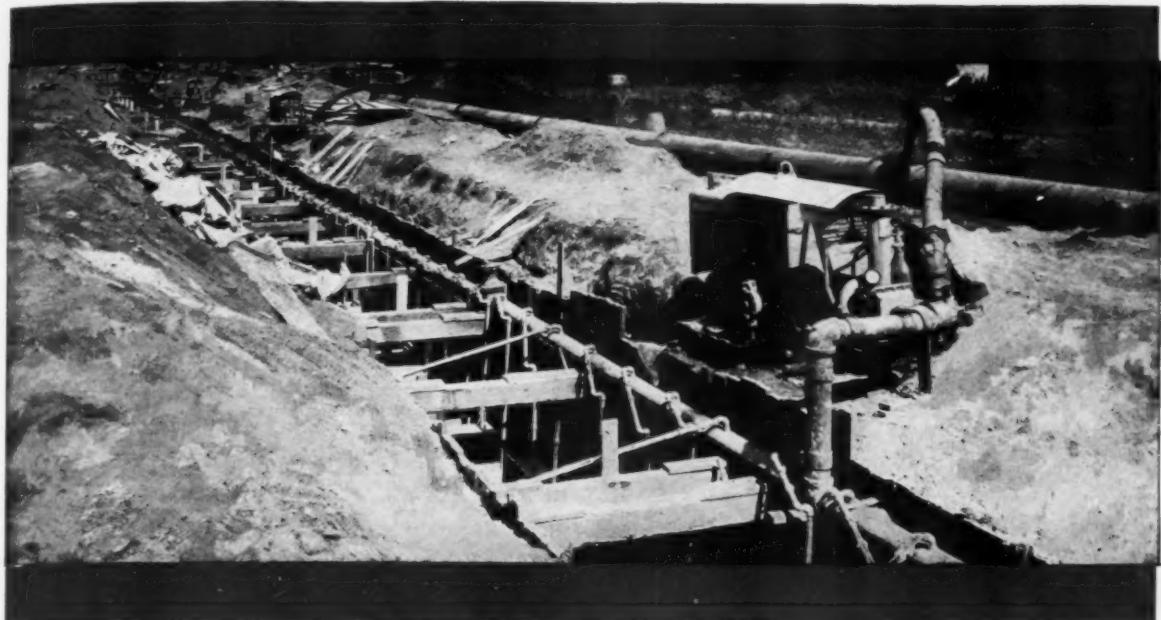


**Twin culverts of Armco Paved Invert
Pipe under a trunk highway**



Installing 60-inch Armco Paved Invert Pipe to replace a wooden bridge

ARMCO CULVERT MANUFACTURERS ASSOCIATION



STAMINA

Powered with Continental P27A Engines, fifteen More-trench Wellpoint System Pumps have been working on this job at Sheepshead Bay, Brooklyn, since July, 1930, and will continue to run until the ground water level is reduced 18 feet. They are running at a constant speed of 1200 r.p.m. and since they were started the only "time out" has been for changing oil and refilling gas tanks

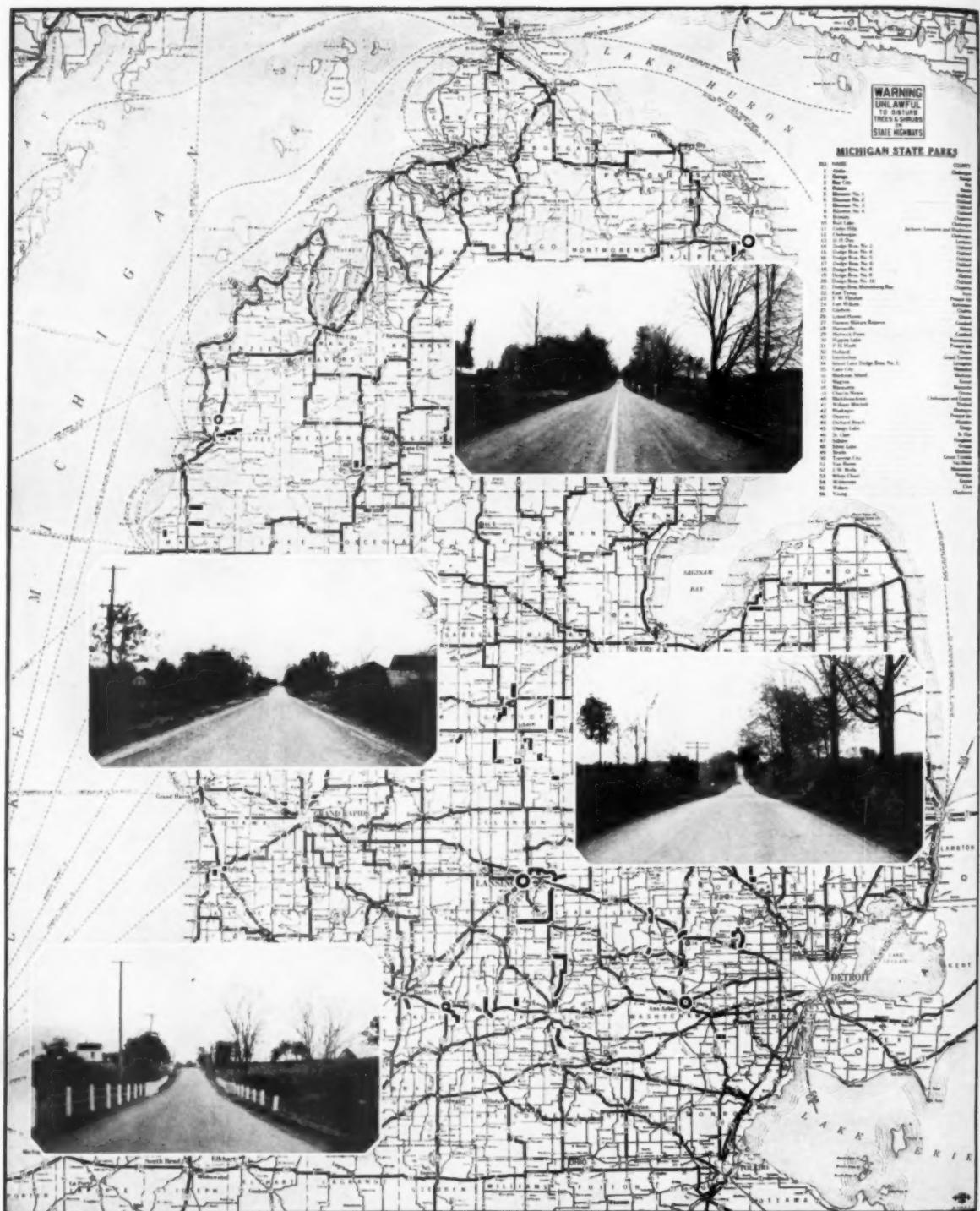
—another proof of the tremendous stamina of Continental Engines. Built of the finest materials available—precision machined—protected by gear-driven force feed lubrication —Continental Engines will outperform and outlive any gasoline engines on the market.

Specify Continental for your own proof of performance and long life.



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A Type of Low Cost Road Improvement Developed to a High Standard

Low cost improved roads are now in demand because they have five distinct advantages:

1. More miles per dollar of investment.
2. Low maintenance cost.
3. Small interest on cost per mile of road with greatest returns on investment.
4. Smooth, durable riding surface.
5. Labor and material used in construction are available from local sources to the extent of 95%.

In two years time, the counties in Michigan have constructed 200 miles of low cost improved roads. In building these roads 15,000 gallons of Standard Asphalt Road Oil and 880 cubic yards of gravel were used per mile of 18-foot width road. The road oil and gravel were mixed on the road with ordinary disc harrows and blade graders.

This type of construction has become a standard one in Michigan because it has proved successful. Many highway officials in other states in the Middle West have testified to the economy of and satisfactory service from roads constructed with Standard Asphalt Road Oil.

If you want to know more about the cost of building roads by the method given above, write for specifications and recommendations:

- Non Skid Surface for Highways.
- Smooth Self-Cleaning Surface for City Paving.

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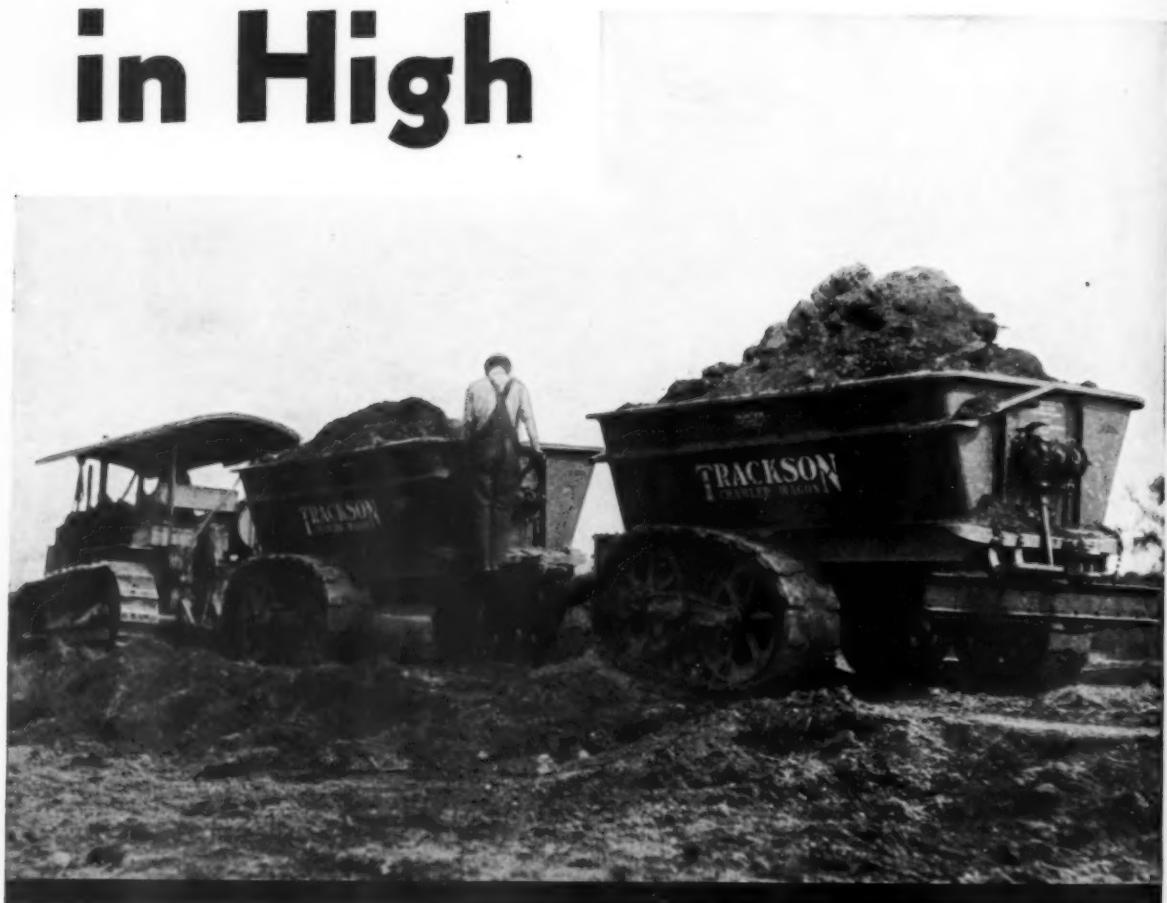
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EVERY PURPOSE

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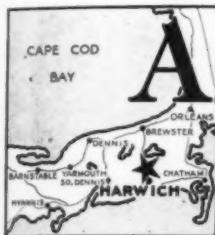
NOT a trick stunt, but a normal operation: Two Trackson Crawler Wagons, hitched together and loaded to full 16-yard capacity, making the round trip from shovel to dump with the "Cat 60" running in high gear all the way. To do that consistently day after day you've got to have crawler wagons that run easy—crawler wheels that are simple in design, without the drag and wear of complicated parts; wheels that can be kept easy-running by quick and easy adjustment; wheels that will *stay* easy-running because their vital parts can readily be renewed in the field. Plan now to put Trackson Wagons on your next job so that you can haul full loads at top speed and lowest cost. Plan now, at least to replace your present worn wheels with Trackson Wheels and be through wasting power on needless weight and drag. Trackson Crawler Wheels *stay* easy-running.

TRACKSON COMPANY, 1323 S. First St., Milwaukee, Wis.

TRACKSON CRAWLER WAGONS

A Chapter 90 Sand Asphalt Job

on Cape Cod



UTOMOBILES bearing license tags from practically every state in the Union and from many Canadian provinces are seen on Cape Cod, Massachusetts, every summer. The increasing tourist trade has made necessary the widening of many of the through roads and a number of the trans-

verse highways. As Cape Cod is practically 100 per cent sand and fresh water ponds, sand asphalt has been chosen by the Massachusetts Department of Public Works as the most economical material for the construction of these highways. During the summer of 1931, the Lane Construction Co. built three projects on Cape Cod. The one of immediate interest was only 1.6 miles of 20-foot sand asphalt pavement in Harwich on Route 24, which has rapidly become a much used thoroughfare between the north and south sides of the Cape. This short section was built under Chapter 90 of the Laws of the Commonwealth of Massachusetts which permits the State, county and town jointly to finance road construction, each paying one-third of the total cost. The contract is awarded by the State and the construction supervised by State inspectors.

THE ASPHALT PLANT AT BREWSTER

The Cummer 500-pound batch asphalt plant was located near Brewster on Route 24 and produced from 175 to 225 tons of sand asphalt per 10-hour day and worked 48 hours per week. This is one of the two plants which was used by the Lane company at this same location in 1930 to produce the material for a 9-mile project on Route 6. Early in 1930 a one-track spur with a capacity of seven cars had been built on a fill $37\frac{1}{2}$ feet high from the material stripped from the top of the sand and gravel pit. During the 1931 operations this spur was used only for the cars of stone dust shipped from Westfield, Mass.

The stone dust was unloaded from the hopper-bottom cars to a pit which fed a belt conveyor powered with a LeRoi engine. This unloaded the material to a chute which fed a second similar belt conveyor which delivered the material to a stockpile behind a barricade. A gate in the bottom of the barricade permitted feeding the dust to the cold material bucket elevator which also handled the sand from another gate in a barricade at right angles to the first.

The sand was brought in from the pit by a Sauerman

With Asphalt Plant Near Brewster,

Lane Construction Co.

Hauled Hot Mix Across the Cape

to Harwich Project



The Cummer Sand Asphalt Plant from the Spur Track Fill. The Entrance Drive for Trucks Is in the Background.



The Asphalt Weigh Bucket, Showing the Valve in the Asphalt Line Which Speeded Operations

scraper operated by a Mead-Morrison hoist with Hercules power. The hoist drums were of such size that this scraper was only operated 15 to 20 minutes out of each hour because of the high speed which brought in sand much more rapidly than the plant could use it.

Asphalt was brought in by a hauling subcontractor by truck from West Barnstable, a distance of 18 miles. The 1,000-gallon tank carried by the truck was unloaded through a flexible flanged pipe with a charcoal fire below. While the fire was maintained the rear tires of the truck were protected by sheet metal. The 70-80 penetration asphalt as it flowed from the truck was pumped to the heating kettle by a Warren pump which was housed in an insulated wooden box with a coil of 1½-inch steam pipe around the inside of the box. This maintained sufficient heat to permit operation of the pump at any time. From the heating kettle the Socony asphalt was pumped to the weigh bucket of the plant by a Kinney steam-jacketed pump. A very satisfactory arrangement for weighing the asphalt was used on this job. The Kinney pump circulated the asphalt from the heating kettle through a loop of pipe with a valve on a 3-foot nipple leading to the asphalt bucket. The pump circulated the asphalt around the loop until the valve was opened which provided a path of least resistance and the asphalt flowed into the bucket. This

eliminated all blowing and splashing of the hot asphalt as well as speeded up the operation of the plant considerably.

At the barricade where the stone dust and sand were fed into the cold material elevator two men regulated the flow. After passing through the drier, the aggregates were raised to the hot material bin, passing through a screen which eliminated all material over 1 inch in size. The oversize stones were delivered by a chute to a small dump truck body so situated that it could be emptied into a truck alongside the plant when filled. The 500-pound batches of sand asphalt were composed of 30 per cent stone dust, 64 per cent sand and 6 per cent asphalt at a temperature of 275 to 350 degrees. The percentage of asphalt was slightly increased when the sand aggregate became finer because of the greater surface of the aggregate to be covered. The temperature of the asphalt was taken at intervals in the heating kettles and the temperature of the mix was similarly taken as discharged into the truck.

In addition to the two cold material elevator men at the plant there was one fireman, one weigh man on asphalt, one weigh man on aggregate, one man operating the Sauerman scraper, one night man who greased the equipment and handled the fires, and a foreman.

In order to supply water for the boilers a well was driven near the plant and water raised to a 1,000-gallon wood storage tank on the hill above the plant by a Warren steam pump.

ROUGH GRADING

This project involved 4,000 yards of excavation and 3,000 yards of borrow. It was located on an old hot-mix road which was torn up and the new top laid on the regraded surface after grading and rolling. An Insley shovel and two trucks were used to handle all of the grading and when the shovel was sent to the borrow pit three trucks were used for hauling. A Warco one-man power grader trimmed the grade which was then rolled by a Buffalo-Springfield 10-ton gas roller.

LAYING THE HOT MIX

On the base course which was laid 2½ inches thick before rolling no forms were used but the base was permitted to spread against the shoulders of the road during rolling. When laying top 2 x 4's from 16 to 18 feet long were staked to give the full 20-foot roadway. Each length of form had a stake at each end for two forms and one in the center. All of the stakes were driven on the outside of the forms. A 2 x 4 about 3 feet long was placed at each joint of the longer forms with one railroad spike on the outside to hold the two ends firm.

The trucks which hauled the hot-mix batches were weighed in empty as they arrived for work in the morning and again at the noon hour, to keep an accurate check on the tare weight. Fairbanks platform scales were located at the top of the hill above the plant where State Inspectors handled all of the weighing.

On the road, batch trucks were backed to the dumping pans and unloaded part of the material. One man was in charge of the dumping to prevent all of the material being unloaded at one point. Immediately after the pan was filled two rakers and three spreaders with

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shovels placed the material uniformly on the road to a depth of approximately $2\frac{1}{2}$ inches for both base and top. This would give a 2-inch base course and a 2-inch top course when rolled. In order to keep the rakes and shovels in good condition, two old galvanized iron wash tubs and a fire wagon were kept just ahead of the spreading and on the shoulder. After the rakes and shovels had been heated in the fire wagon they were dipped in the kerosene in the wash tubs to prevent sticking of the material. A Buffalo-Springfield 8-ton tandem steam roller did all of the rolling on the hot mix.

A State Inspector with a 10-foot straight-edge checked the top course during rolling so that all low spots could be raised with new material and any high spots could be worked out by running the tandem roller over the bumps from different angles.

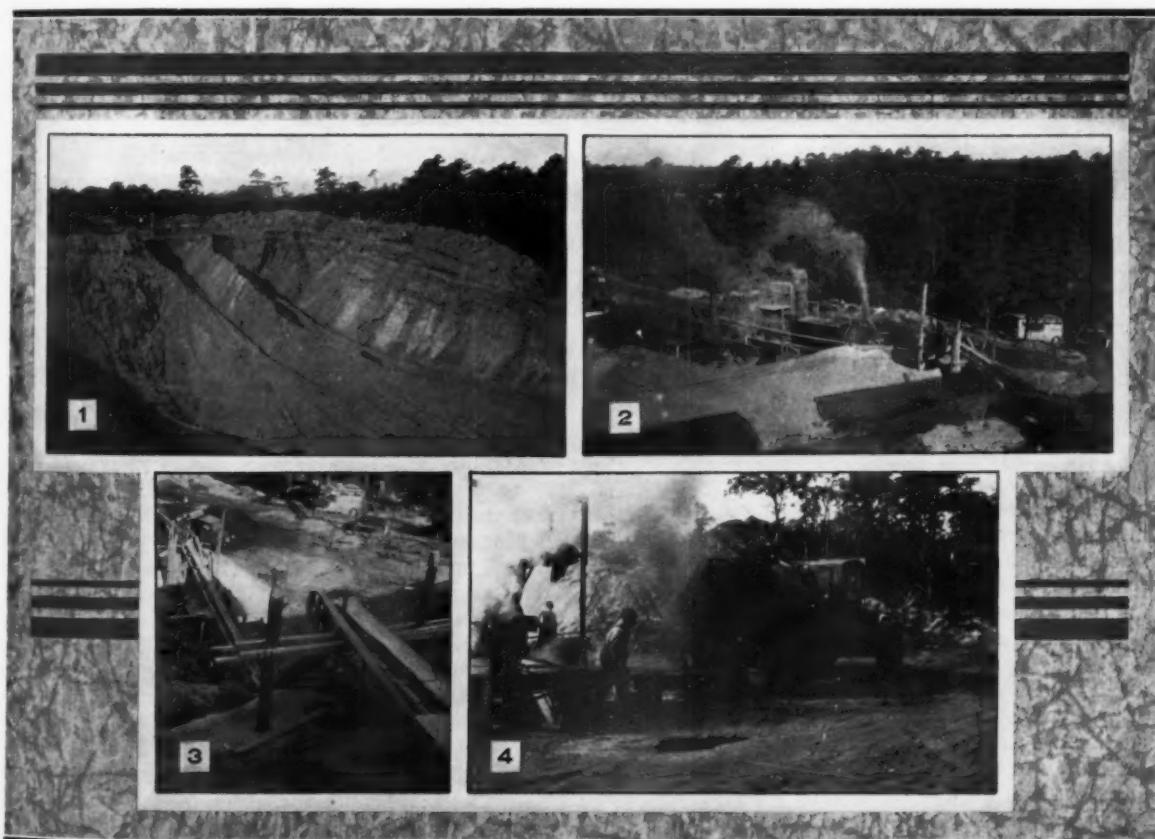
PERSONNEL

The grading of this 1.6-mile project of 20-foot sand asphalt paving was started July 1, 1931, and the plant was in operation July 21. The road was completed on August 26, 1931. This work was in charge of A. C. Woodhouse, Superintendent for the Lane Construction Co. of Meriden, Conn., and Richard Nye was Resident Engineer for the Massachusetts State Department of Public Works.

The Use of Paper for Curing Concrete Slabs

AN unpublished departmental report by Mark Morris, Research Engineer, Iowa State Highway Commission, describes the continuation of the extensive study of methods of curing concrete undertaken several years ago. During the construction season of 1931, the Iowa State Highway Commission investigated the use of two heavy duplex papers proposed by their respective manufacturers for use in curing pavements and concrete floors. These duplex papers are of similar construction each consisting of two layers of heavy kraft paper sealed together with a thin coating of asphalt. In order to compete successfully on a cost basis with moist earth curing, these papers must be used several times, probably five to nine times. At each application of the paper, samples of it were taken and given a rigorous test in the laboratory to determine its ability to prevent loss of moisture from mortar cured for the first 24 hours under wet burlap.

From previous work on methods of curing concrete, it has been found that satisfactory curing requires that the concrete retain at the age of 6 days at least 80 per cent of the original water content. These papers showed losses varying from 0.61 to 4.29 per cent at the initial addition of the paper to 2.00 to 7.86 per cent for the paper in the condition as found after the last application. Concrete losing this small amount of water in 6 days may be considered to have received satisfactory curing. Properly handled, therefore, these duplex papers were found to provide a satisfactory means of curing concrete pavements.



SCENES AT THE ASPHALT PLANT NEAR BREWSTER ON THE NORTH SIDE OF CAPE COD

1. The sand pit worked by a scraper for the second year.
2. The set-up of the Cummer asphalt plant as seen from one of the stone dust cars on the 37 1/2-foot fill.
3. The pair of belt conveyors and chute which unloaded the stone dust and carried it to the stockpile near the asphalt plant.
4. Kerosene fire in a metal trough used to heat the connecting pipe between the asphalt tank truck and the pump.

Construction Management—

By
Richard Hopkins

*Richard Hopkins Company
Albany, New York*

THE management of construction work may well be classified into two departments: 1. The objective art of bidding for the contract, planning the work, and bringing it to completion; and 2, the subjective art of combining these elements of construction to discover leaks in profit due to avoidable time losses in the various steps involved.

Each organization should appreciate what class of work it is best equipped to handle. Doing work in one locality only is generally not a good policy. Because two jobs lie close to each other is no reason why the same organization should attempt to build them if they are dissimilar. Furthermore, in some years, the volume of work let may be small and the competition severe in the region where the contractor has been doing business. Prices, however, may be much better in another section. The contractor must meet the market price, but he can always choose the market in which to sell.

As a general rule, a man who obtains more than 20 per cent of the work on which he bids is not a good bidder. He is bidding below the market. Good bidding is more often found among those who are awarded contracts for fewer than 10 per cent of their bids. It is much better to let machinery depreciate, and parts of an organization stay idle, than it is to lose cash from a bank account. From two to six months before a job is planned to be finished the contractor should be looking over prospective work and putting in occasional bids on desirable jobs. There is no more pitiful figure in the construction world than the man who has a smoothly running and efficient organization on a particular job and waits until a week or two before it is finished to start bidding on new work. The result is likely to be bad from three angles: the new work may not be the right kind, it may not be obtained in time, and the price may be much too low.

The head of an organization should be introspective and critical of the quantity of work that he can have under way at one time. Most contractors do too much work rather than too little. The financial strain and lack of proper attention both to general planning and small details are generally harmful to profits under such conditions.

It is assumed that the bidder makes up an estimated field cost which is based on his own records. It is further assumed that to this field cost he adds his esti-

Intelligent Bidding

Careful Selection

of the

Superintendent,

the Foreman

and the

Master Mechanic

mated overhead which includes such items as interest, depreciation, insurance, repairs, workmen's compensation, camps, office, and freight and loading charges, in moving equipment to the job. This estimated total should be close to his real total cost if labor, the elements, and the supervising engineers all act in a perfectly natural way. At this point in making up the bid, the question of contingencies enters. What are the soil conditions? How much harm will a week of rain do to progress? Will some other contractor or some public service company be working on the job at the same time, and, if so, what are their records for cooperation? Are there bridges or other structures on the job that will slow down the entire program? The bidder should judge what these contingencies will amount to in dollars and add them to the previous total.

The bidder is then ready to decide what percentage of profit or what lump-sum profit he will add to his total estimated cost. The sum added for profit will depend on whether or not the bidder is "hungry." It will depend on whether or not the job is in a market that has more than its share of labor troubles. It may vary through a wide range, depending on whether it is largely a labor job or largely a material job, and on the definiteness or indefiniteness of the engineering inspection that can be expected.

THE SUPERINTENDENT

It is assumed that the contractor has a head office that directs all field operations on the different jobs and handles all administrative work. A superintendent may be assigned to a particular job because he is the only one available, or because the job is suited to him and his organization. If possible, the latter reason should be the one for giving him the job. The superintendent is the all-important man on the job. His personality is

of vital importance, very much more so even than that of the contractor himself. It is not always possible to have a halo around the head of the superintendent, but all construction men are learning to appreciate that nothing pays better dividends than sentiment. The superintendent should be a real leader, a friendly czar, a man who knows all the letters of the construction alphabet. Above all, he should be a man who knows how to plan and how to get performance and who knows how to dovetail the different operations into a completed whole.

THE FOREMAN

Every foreman should have such ability as to command the respect of his men. They may find fault with his temperament and with some of his methods, but they must respect his ability if he is to be successful. They must feel that he knows his job. There should be a foreman on each particular operation; there should be definite responsibility for each task. If only two men are working by themselves, one of them should have the responsibility for getting the task done in the right way. Cooperation among the foremen is a prime necessity. Personal feeling and jealousy between two foremen should never be allowed to interfere with the progress of the work.

AN ENGINEER-ACCOUNTANT

A large number of contractors are coming to realize that it is wise to combine their engineering and accounting work on a job, and place both under the control of a trained engineer. There is a close inter-relation between accounting and engineering, and nobody should be able to interpret cost figures better than an engineer. His costs will be up-to-date, and with his help, it will be possible to "lock the barn door before the horse is backed out of the stall." On account of his training, the engineer is able to suggest changes in methods and personnel and even in equipment when the proper costs are not being obtained. The items of extra work, special measurements, necessary departures from plans and specifications—all have engineering and accounting woven so closely together that it is best to have them handled by one man.

THE VALUE OF THE MASTER MECHANIC

The selection, purchase, and care of equipment were never so important as at present. In 1910, or thereabouts, 85 to 90 per cent of the cost of a grading job was the payroll. About 1915, when hard-surfaced roads came to be the national vogue, the payroll was still more than 50 per cent of the total cost. Now all the major operations and most of the minor operations on a job are done by machinery. Steam machinery has been greatly improved, the automotive engine has taken a preponderant hold on all construction equipment, and the diesel engine is making steady progress. No construction organization can long face the present competition without being machine-minded.

Next to the superintendent the master mechanic is the most important man on the job. He should be an all-round mechanic of course, but with the present-day machinery he should be particularly competent on automotive work. He should have enough help to make quick repairs in the event of the inevitable break-down. Most of the minor repairs and some of the major ones should be made nights, Sundays and rainy days. If the master mechanic is not given authority to employ and discharge machine operators he should at least be consulted by the superintendent on both employment and discharge. When the purchase of any piece of equipment is contemplated, his opinion should be asked on three questions: 1. Is the machine staunchly built? 2. Is it well designed? 3. Is a large repair bill or a small repair bill being bought with the machine?

He should see and approve all repair bills before they are paid. He should have authority to keep on hand whatever repair parts his experience teaches him are most often needed. He should be "construction conscious," and should appreciate thoroughly the earning power of each machine and the consequent loss when the machine is not in operation.

COMPETENT OPERATORS

The importance of the master mechanic's duties has been particularly stressed, but no good master mechanic can show results unless he has the help of experienced and competent operators on the different machines. Good foreman can show only indifferent results when key machines have poor operators. The machine cannot function without a hand to guide it.

Often the major portions of big jobs are run with old equipment that has long since been charged off, but in the hands of good operators it is earning dividends every working day. On the other hand, a visit to a similar job with new machinery, manned by incompetent operators, often reveals numerous break-downs which cripple any effective schedule, and, at the finish of the job, there remains a pile of junk and a depreciation charge double or even triple what a reliable estimator had a right to expect. Physicians and hospitals exercise a big part in every-day life to keep the public in good health. The construction physician is the master mechanic and when he and his internes—the machine operators—all know their job, the piece of construction under their hands is in good financial health.

DON'T OVER-EQUIP THE JOB

Saving one shovel, one roller, or any other piece of equipment by speeding up the production of those units working on the job, cuts down the machinery charge against a job. Loading a job up with unnecessary machinery increases the machinery charge. Moving, loading, and freight charges on heavy machinery constitute a cost that is not sufficiently appreciated. Frequently, if a heavy machine is to be transported a long way and

(Continued on page 50)

Details of a 17.5-Mile

Paving Project

in

Iowa

Harrison

Engineering & Construction Co.

Rang the Bell

With a Maintained Average

of 110 Feet per Hour

Pouring 18-Foot Slab



*Hitting the High Spots
on 24-Hour Concrete*

WHILE not so very different from other paving contractors working in Iowa this past summer, the Harrison Engineering & Construction Co., a Delaware corporation with offices in Kansas City, Mo., handled its work in such a smooth manner, with continued attention to details to insure the even progress of the work, that their job near Carroll, Iowa, is one which merits the attention of other contractors. It is not the great spurts of record paving that make the large mileages at the end of the season but the continued pushing of the work at a constant rate that is conducive to the best work on the part of every man in the outfit.

CROWDED CONDITIONS AT BATCHING PLANT

The job started with a handicap of a crowded condition at the batching plant and cement dock because of the narrow space allowable for the set-up. In spite of this the fleet of thirty-four one-batch trucks managed to get through with remarkably small delays and deliver the batches to the paver in fast time. A Koehring crane with a 45-foot boom and a Blaw-Knox 1-yard clamshell bucket unloaded the sixteen cars of aggregate needed each day for the work on the road. Two men in the cars spotted the bucket when needed and cleaned up the car at the end. They also picked the rags from the two screens on top of the Blaw-Knox bins and batcher plant. The batches hauled by the trucks consisted of: 1,714 pounds of gravel, 1,462 pounds of sand and 669 pounds of cement. Large stockpiles were maintained against the chance of any breakdown in delivery. One contractor running a tandem outfit fully believed

in large stockpiles and his outfit was saved from a complete shut-down one Monday morning when a wreck in the northern section of Iowa put the greater part of two gravel trains into the ditch. Another contractor in Minnesota did not believe in large stockpiles because they were a waste of material, so he relied entirely on daily deliveries from a pit 150 miles away. He must have carried a rabbit's foot in his pocket for he seemed to be immune from the usual delays that cause so much worry for superintendents on aggregate deliveries.

HANDLING THE CEMENT

The fleet of Ford, Chevrolet and International one-batch trucks equipped with dual pneumatic-tired wheels backed under the batcher and then drove forward and turned in the narrow roadway, necessarily blocking the incoming empties, and then backed into the pit to receive the cement batches. All batch hauling was done by individual truck owners at a batch rate.

The southerly 8½ miles of the 26-mile project was subbed in accordance with the general practice this year in the middle west to give the maximum number of outfits an opportunity to work and thus increase the employment of labor. The first batcher set-up for the Harrison job was at the town of Auburn near the north

end of the project. Four miles of pavement was poured, completing the northerly section first, with a 3-mile dead haul for the batch trucks. Then the batcher plant was moved to Carroll and 5 miles paved from the north to Carroll and then the remaining 8½ miles from the south toward Carroll. The pouring was started May 2 and was completed September 10, 1931.

The cement dock at the Carroll location was 65 feet long and about 9 feet wide, so arranged as to take care of the unloading of two cars of cement at one time. The trucks backed into the pit and stopped against the excavated bank under the trap. The trap was well counterbalanced and had a galvanized iron facing inside so that it dumped clean with every batch. A canvas flap dropped into the trucks and prevented scattering of the cement to any appreciable degree. The trap was hinged on a pipe and lubricated to turn easily so that little pull on the rope controlling it was required. The batching of the cement was subbed and a group of six men handled the entire unloading and batching. There were two shovelers in each car and one man who

wheeled, weighed and dumped the cement carts. The Fairbanks scales were located at approximately the center of the platform with make-up boxes of cement on either side so that no matter from which direction the wheeler was coming he could correct the weight without any delay. The dumping trap was located at one side of the scales. As the trucks drove away from the cement dock they stopped about 150 feet distant where a man stepped onto the truck from a small platform and covered the cement with sand.

ARTIFICIAL POND CREATED FOR BOOSTER PUMP

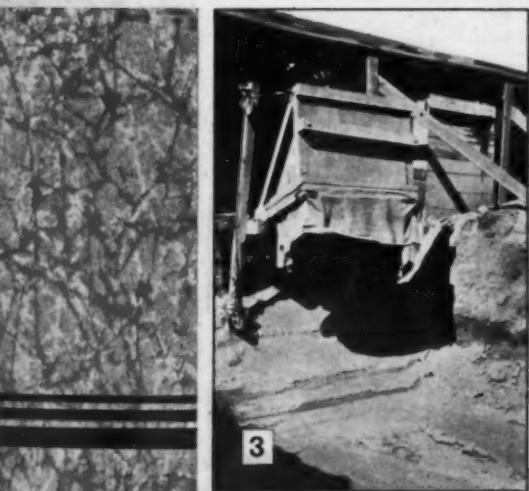
Three pumps were used to insure a constant supply of water for the job. A Jaeger road pump was located about 2 miles from the north end of the job and pumped to an artificial pond created by damming a drainage gully with a wood sheet piling structure. At Carroll a C H & E No. 11 triplex also pumped to the pond from which a second C H & E pumped to the 2½-inch pipe line along the shoulder. Gate valves were inserted in the line every 1,500 feet so that it was possible, when



1



2



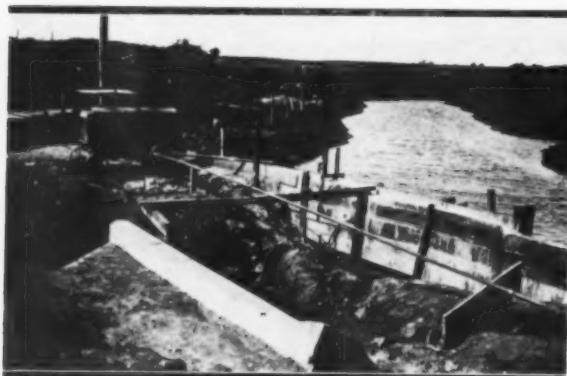
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AGGREGATES, CEMENT AND REINFORCING AT THE RAILROAD SIDING

1. Unloading sand and gravel to the batcher, showing also the stockpiles and protector for the batch man from sun and wind.
2. A dual pneumatic-tired one-batch truck receiving its batch of cement. Note the absence of flying cement and the protection of the scale.
3. A detail of the cement dumping trap.
4. A stock of reinforcing mats fabricated on the job for use over culverts and at approaches.



The Artificial Pond and Booster Pump

conditions were right, to shut off the line between the paver and the northerly pump and use the single pump on the sprinkling line and the other two for supplying the paver. Taps were placed in the line every 250 feet for the paver hose and the paver carried 200 feet of 1½-inch hose.

GRADE WELL-PREPARED AHEAD OF THE FORMS

The grade on which this concrete paving was placed was a typical black glacial prairie soil. A Caterpillar Sixty with a 12-foot Super-Mogul blade grader cut the grade ahead of all form setting and a Lakewood grader-rooter was used to loosen the hard grade where it was too high for the blade to work it out easily. As soon as the stakes were set and the pins placed for the line and grade the Ted Carr Formgrader cut the form trench on both sides of the grade. A crew of seven men handled the work of trimming the grade along the form line and the actual setting of the Blaw-Knox 10-inch forms. The trench for the thickened edge of the pavement was cut by a Caterpillar 6-foot blade grader even ahead of the setting of the forms so that there was a minimum of machinery within the restricted grade after the forms were in line. Just ahead of the Hug subgrader that cut the grade to approximately true section, two teams with fresnos cut out the excess dirt that was piled up by the blades, so that usually only two men were required behind the subgrader to trim up the grade. The entire grade, whether in fill or not, was rolled with a Galion 5-ton roller ahead of the Blaw-Knox turntable. Two men just ahead of the paver tamped and aligned the forms for the finishing machine and one man oiled the forms.

TRANSFORMING THE BATCHES INTO CONCRETE

Perhaps the most prominent single item in the concreting outfit was the sign obviously hand-painted and by one not too accustomed to that art, which read, "I LOAN NO TOOLS," painted on the side of the paver by an exasperated paver operator. Why will the average citizen borrow umbrellas and never return them and the mechanic think that tools are common property, so that the man who keeps his tools in one place where he knows he can find them when he needs them, is always being pestered by the happy-go-lucky truck driver or other mechanic who knows where he can go to find someone that might have the wrench or other tool that he wants but never has in his kit?

The paver crew maintained the high average of 105

to 110 feet of 10-7-10-inch slab 18 feet wide throughout the 12 hours of each day's work. In seventeen consecutive working days, which included three days when because of rain only 500 to 600 feet of slab was poured, this outfit laid 19,500 feet of pavement.

The form gang started work at seven in the morning and set 1,500 feet of forms by four-thirty in the afternoon when they stopped work. The forms were brought forward as rapidly as pulled by a Chevrolet truck with a flat bed. This truck worked from seven in the morning until about two in the afternoon on hauling forms. It also brought forward the burlap as that was removed from the slab, and then worked until six in the afternoon on the hauling of pipe for the water supply.

The grade gang started work at seven and worked until five preparing the grade for fully 1,500 feet of slab ahead. This entire paving crew worked 42 days with a loss of only three hours due to mechanical trouble anywhere in the work. That loss of time was at the paver. Other time was lost because of weather which gave the contractor some cause for worry because of continued rain early in June.

The parade of one-batch trucks was dumped and cleaned at the skip of the Rex 27-E paver by the dumper who spotted them and cleared them with the minimum loss of time. The paver pulled a Carr subgrade planer from which two men shoveled the excess dirt as it accumulated. These two men were also responsible for the placing and renewing of the six rolls of tar paper which are required to cover the grade in all Iowa paving to prevent the absorption of water from the concrete by the grade. Six 38-inch rolls of paper were used across the 18-foot grade, allowing for slight lapping of the rolls.

The entire reinforcing for the slab was placed by one man. Ahead of all paving operations, however, the man who oiled the forms placed the long 40-foot bars for the side reinforcing along the shoulder end to end and the center bars on the grade. Thus all the steel man was required to do was to place the 11-foot bars across the slab with the pins that carried them at the proper elevation. This man drove the pins first and then threaded the transverse bars through the slots in the pins. It was noted that the pins were driven much straighter when placed in this manner than was the case where the bars were placed in the pins before driving. The transverse bars were wired to the longitudinal bars wherever they crossed and to the eight "hairpins" placed at every expansion joint. The transverse bars were also supported by removable supports at the center of each bar until the concrete was poured and held up the bars. The side bars were spliced with wire ties and supported by removable stirrups which slipped over the forms. These held the bars 9 inches from the forms and 2½ inches from the top of the slab.

Two men prepared the expansion joints, which were placed every 60 feet in the slab, well ahead of paving and had them spotted along the shoulder. The joints were made up of two 5-foot uniform depth pieces for the center 10-foot section and two other pieces varying from 7 to 10 inches for the outer sections each 4 feet wide. When the joints were set with the caps in the top of the placing machine they were supported by four staples like the double pointed tacks used for laying

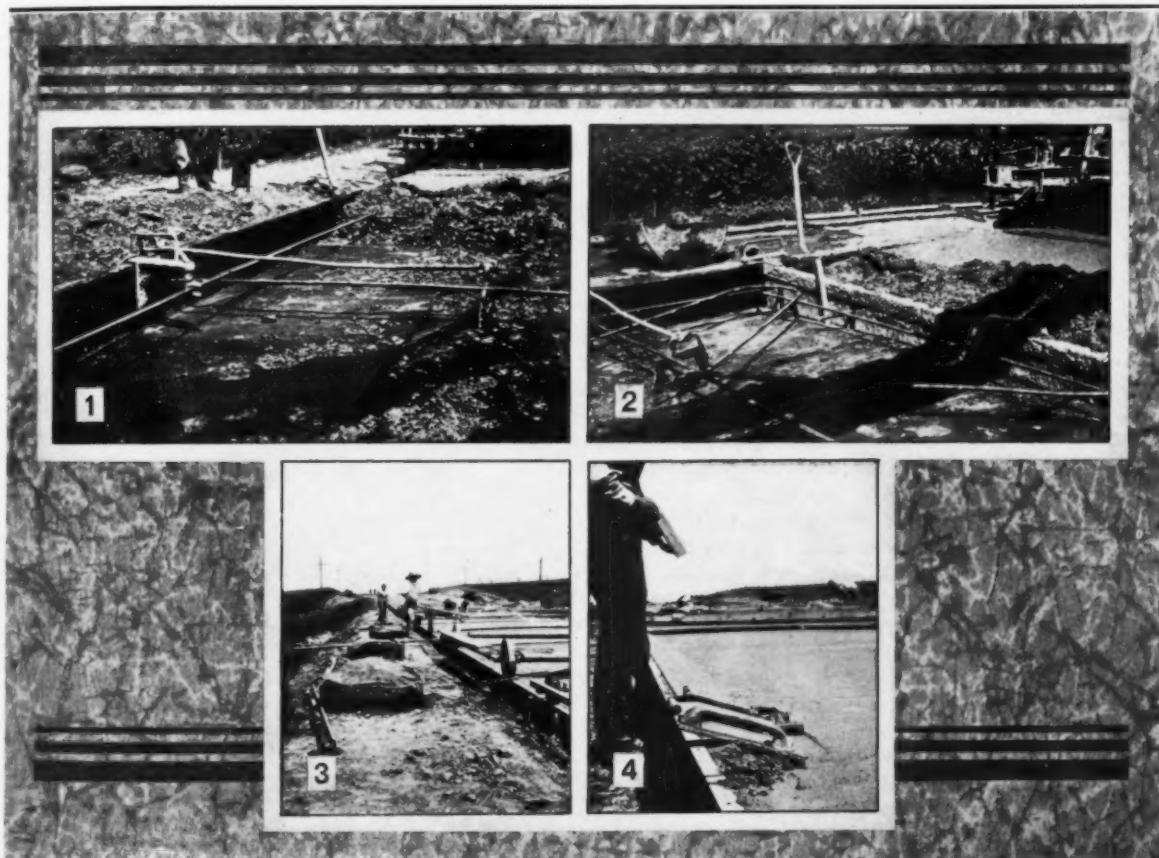
straw matting but made of 1-inch rods pointed at the two ends. They were about 9 inches across the top and were driven diagonally so as to set close to the expansion joint on both sides to prevent its moving in either direction. The 2-foot dowels through the expansion joint and spaced 2 feet apart were covered with steel sleeves on the end toward the paver. The steel men also set and wired the eight hairpin bars at the expansion joints, one at each outer corner formed by the joint and one at each inner corner formed by the joint and the center dummy joint.

There were two puddlers and one spader who worked on one side while the finishing machine operator spaded the other side. The Ord finishing machine on its second pass over the concrete pulled a Heltzel Cleft-Plane machine for inserting the 2½-inch ribbon to form the center dummy joint. One man on the machine guided the ribbon into place and hand floated over it.

There were two men on a home-made bridge who pulled the 12-foot longitudinal float. The float was made from a section of Heltzel curb and gutter form with a 1-inch redwood plank bolted to the bottom with counter-sunk bolts. The two finishers floated the slab

first with an 8-foot float and then checked it with a Heltzel 10-foot straight-edge. Any depressions were corrected with the float and any high spots removed with the straight-edge. After rechecking with the straight-edge they used a 10-inch canvas "bow" belt. This was an ingenious device made up by one of the older finishers so that the belt was held taut during finishing, thus producing a uniform finish to the slab across the entire 2-inch crown. Following this the finishers used a standard flat belt of the same width.

A simple bridge set on the forms was used by the man who removed the caps from the tops of the expansion joints. He also edged the slab, and when lip curb was being run he was one of the builders for that work. On lip curb there were one man and one helper on each side setting the Blaw-Knox 3-inch lip curb steel forms and building the curb 12 inches wide, floating and edging it. Concrete for the curb was supplied by the puddlers, who filled the trays made of old oil drums cut lengthwise which were spotted along the shoulder properly spaced by the helper, who brought them forward as soon as emptied. The concrete was covered with wet burlap to prevent drying out and too early setting of the con-



PLACING REINFORCING BARS, "HAIRPINS" AND EXPANSION JOINT AND BUILDING LIP CURB

1. View from the paver looking toward the finishing machine, showing the tar paper covering the subgrade and the method of supporting the side bar and transverse bars with removable chairs. 2. The method of supporting the expansion joints with staples driven diagonally to support the placing machine on both sides. Note the handle at the left end of the expansion joint for removing the cap and also one of the eight "hairpins" at the left. 3. Half oil drums filled with concrete and covered with wet burlap spotted along the shoulder for the lip curb builders. 4. Building lip curb showing the wooden float, steel "mule" for shaping the curb to specified dimensions and the finisher cleaning his final float.



The "Bow" Belt for Finishing the Slab. Note the Steel Pin in the Foreground to Prevent the Blowing Over of the Belt.

crete and a little water was placed in the bottom of each tray before the concrete was shoveled in.

A large rolling bridge was used to carry the burlap in 3-foot wide strips and two men spread the burlap first on the bridge and then from it to the slab. The burlap was sprinkled normally by one man but on hot and windy days, when the moisture would dry it out very rapidly, a second sprinkler was used. The burlap was wet the second day until the inspector had checked the slab for high spots and then until the cover crew was ready to place the 2-inch cover of earth.

The cover crew also pulled the forms. They were allowed to pull all the forms of the previous day's run up to noon, in the forenoon of the following day and the afternoon's run in the afternoon of the following day. The sides of the slab were protected immediately after the pulling of the forms by plowing earth against the slab. The cover material on the side where the rough grade had been thrown was simply shoveled onto the slab. On the other side the large 12-foot blade grader was used to throw the earth toward the slab to make the shoveling easier instead of the usual running of a scarifier over the shoulder. About twelve men handled the cover with three sprinklers. The cover was sprinkled for six days.

The contractor kept an efficiency man on the grade at all times. One of his duties was to give each truck driver a batch check as his load was dumped at the paver. He also noted every minute's delay at the paver and the cause and reported them daily to the superintendent, who studied them to note any repetitions of the same causes and took steps to eliminate any which were causing trouble. In this manner the superintendent was free to cover the entire job with the knowledge that any delay at the paver would be studied by a competent man and the causes of trouble determined at once. The usual menial job of checker became a most important one with the added continuous observations of the trucks, paver and finishing machine.

PERSONNEL

This 17.5-mile project was paved by the Harrison Engineering & Construction Co. of Kansas City, Mo., with A. P. Little as Superintendent. For the Iowa State Highway Commission, D. F. Raver was Resident Engineer and J. H. Bauerle, Inspector.

Construction Management

(Continued from page 45)
the work required of it will take only a few weeks, it is cheaper to rent a machine close at hand.

A point about which there is a sharp difference of opinion among contractors is that of maintaining a schedule. All will agree that a job that drags is seldom profitable. One school of thought upholds the ideal of 110 cubic yards of earth per hour for the small shovel and 50 cubic yards of concrete per hour for the paver, and there is the continual drive to equal these figures on a few big days. A few trucks and a few teams as well as a number of men are added to the payroll. The other school of thought insists on an orderly progress of the work along the line of a well-planned schedule. There are no big days, but there are some good weeks and some wonderful months. All work proceeds at an orderly consistent pace. The advocates of this method argue that the job that is built the quickest is not always built the cheapest. Final unit cost is the yardstick to decide on the relative merits of the arguments put forth by these two widely divergent points of view.

LABORERS THAT ARE SATISFIED

There is an old axiom that no well-conceived military operation can be a success without good infantry. No construction operation can hope to be successful without good laborers, who are satisfied with their tasks. Their length of service is measured in years—not in days or weeks—and turn-over is small. Their camps are clean, their food is good, they know that the superintendent is a fine boss and always treats them square. Underlying it all is the firm conviction that they know their job and that the boss knows his.

From *Proceedings, American Society of Civil Engineers*, Volume 57, Number 7, pages 1035-1038.



THIS BUCYRUS-ERIE 32-B SHOVEL WAS THE FIRST TO CROSS THE NEW GEORGE WASHINGTON BRIDGE

The shovel was taken from stock at Englewood, N. J., by the Gerosa Haulage & Warehouse Corp. of New York City, using a 40-ton Rogers Bros. trailer drawn by a Mack truck to haul it across the bridge for a \$3.00 toll and deliver it to Charles Shaffer & Sons, Contractor, at its Westchester County Parkway job between Briarcliff Manor and Crotonville, N. Y.

Bulk Cement

from

Barge

to

Bin

The Handling of Cement

for the

New Concrete Highway

at

West Point Military Academy

WEST POINT, N. Y., is the mecca for many thousands of tourists and adoring mothers and sweethearts every year to see first hand the training school for future second lieutenants and generals of the United States Army. The highway connecting the two main gates had been in place and received heavy service for many years, carrying the cars of visiting friends and the heavy army trucks which are constantly moving about the reservation. During the past summer this has been replaced with a 30-foot concrete highway in harmony with the progressive character of the institution.

As West Point is located on the Hudson River where there are several cement plants, the contractor elected to use bulk cement delivered by barge from Hudson, N. Y. A fleet of four barges with one mother ship equipped to furnish compressed air and electricity was used by Dwyer Brothers of Kingston to deliver the cement from the plant of the Alpha Portland Cement Co. at Hudson, N. Y. The barges were loaded with 1,500 barrels per trip. This was not the capacity of



The Cylindrical Cement Bin Showing the 4-inch Steel Delivery Pipe Arched Over the Top of the Bin

the barges but the docking facilities at the North Dock of the reservation would not allow a heavier draft.

The L. G. McConnell, the mother ship of the fleet, was equipped with a 350-cubic foot per minute Chicago-Pneumatic compressor operating at 80 pounds pressure. The air compressor and unloading machinery were electrically-driven by standard 3-phase 60-cycle 220-volt A.C. squirrel cage motors. The advantage in using this type of motor is its simplicity and reliability due to the absence of brushes. Also A.C. power, on account of its almost universal use, can be readily obtained at most docking points. In this instance, however, a 120-horsepower Sterling marine type gasoline-driven alternator with a continuous capacity of 60 kw furnished the energy necessary for the motor-driven equipment.

Each barge was built with a pit just aft of midships measuring about 7 x 12 feet in plan into which a Fuller-Kinyon Type B cement pump was lowered from the mother ship to unload the cement. The cement pump consisted of a perforated circular disk for breaking down the cement which was picked up by the rotating screw inside the casing. Compressed air was let into the delivery tube to expedite the flow of the cement through the rubber and steel pipes to the storage bin. The pump unloaded the cement at the rate of 100 barrels an hour through the 70 feet of 4-inch rubber hose to the dock and thence through 260 feet of 4-inch steel pipe and over a goose-neck into the 450-barrel Blaw-Knox steel batching bin. The cement pump was equipped with a

30-horsepower, 3-phase, 60-cycle, 220-volt motor and required only 188 cubic feet of free air per minute. For the operation of the cement pump one man was used on the pump and another feeding the cement through one of the gates in the side of the pit. This method was considered more effective by Dwyer Brothers than simply letting the machine into the barge and working it down until it had dug its own pit in the load.

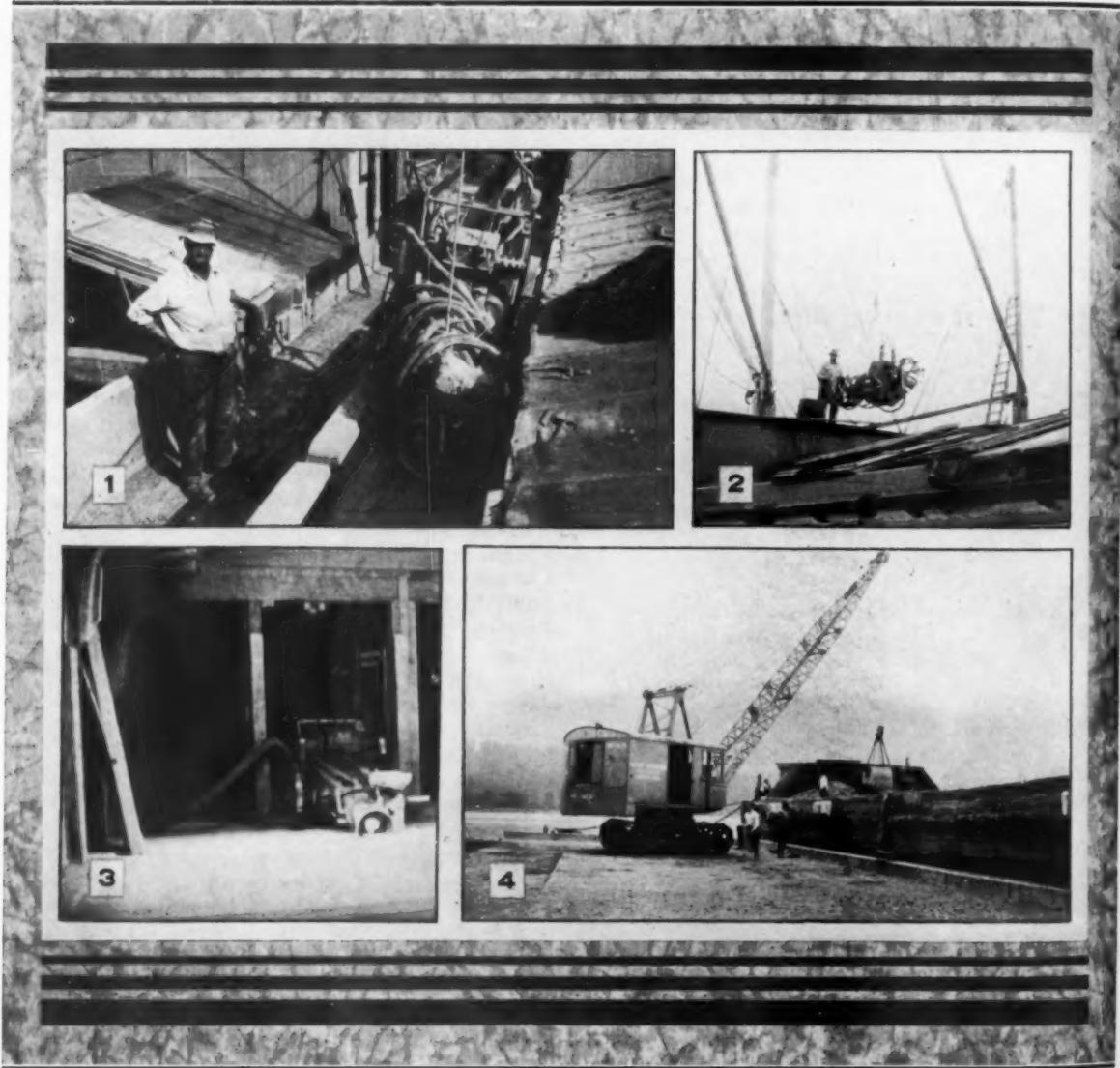
HANDLING THE AGGREGATES

Both sand and crushed stone were received at the same docks by barge. The stone was shipped from South Bethlehem, N. Y., by the Callahan Road Improvement Co., and the sand came from the Stony Point Sand & Gravel Co., of Stony Point, N. Y. Unloading the barges was handled by a Northwest crane with a

55-foot boom and a 1½-yard Erie clamshell bucket, with two men on the barge and one operator for the crane. The materials were unloaded to a small hopper on the dock so that the crane could work continuously and not have to wait for the single truck which hauled about 300 feet and dumped the aggregate for sidehill storage. A Bucyrus-Erie crane with a 40-foot boom and a 3½-yard Erie clamshell bucket handled the aggregates from the two stockpiles to the three-compartment Erie AggreMeter bin.

The labor organization for the handling of the cement and the aggregates consisted of: the two men on cement on the barge with the usual crew of the contractor operating the barges; on unloading the aggregates, one craneman, an oiler, who also assisted in cleaning up with

(Continued on page 64)



CEMENT AND AGGREGATE HANDLING AT THE NORTH DOCK OF THE WEST POINT MILITARY ACADEMY

1. The Fuller-Kinyon Type B cement pump on the deck of the mother ship of the cement barge fleet. 2. Lowering the cement pump into the hold of a cement barge alongside the mother ship. 3. The cement pump ready to work, showing the delivery hose at the left. 4. Sand and stone were handled by this Northwest crane by a one-half swing from the barge to a hopper from which the trucks were loaded.

Trench Construction

Bracing

TO offset the natural tendency of earth to slide or cave into a trench when the lateral support is removed by excavation, has ever been a problem; not always an unsurmountable problem, to be sure, but often taxing all the skill and ingenuity of the engineer or contractor. The problem becomes more acute when a load of any description, for instance a building, is superimposed on the ground and its weight must be carried directly or carried by the support given to the side of the excavation.

Trenching and excavations of any kind are not done aimlessly. There is always some purpose in mind, something definite to be accomplished. It may vary from draining a patch of land by a shallow ditch to putting in a foundation for an immense skyscraper in the midst of a number of large buildings that will have to be supported during the progress of construction work.

Confining this discussion to such excavations as are incidental to the erection of a building or structure, we may conveniently make three classifications to include them all:

1. Trenches that require no shoring or bracing.
2. Trenches that do require sheeting, shoring, or bracing.
3. Excavations adjoining buildings or structures that must be securely and safely supported during construction work and left in safe condition when work is completed.

SHALLOW TRENCHES IN FIRM GROUND

In considering the first group, the most important thing to be determined is whether or not the excavation really needs bracing. Ordinary trenches or excavations, 4 or 5 feet deep in firm ground, seldom require support. Excavations more than 8 feet deep should have their sides sloped and have their banks kept free of any loading for some distance back from the edge.

If the excavation is a narrow trench, say 3 or 4 feet wide and 7 feet deep, it is advisable for safety to take the additional precaution of bracing, as men working in the trench might otherwise be caught by a cave-in that they could not run away from as they could were they working in an open basement excavation.

SHEETING AND BRACING TRENCHES

When the sides of the excavation have to be supported, if the earth is firm, it usually is done by bracing. This consists of using two short planks—one on each side of the trench—and a cross-piece or brace, wedged in between them. Extension, or screw-braces are now commonly used for this cross-piece. The bracing is placed at intervals from 5 to 8 feet apart.

By

John E. Ericsson

Commissioner of Buildings

City of Chicago

When the soil is loose or otherwise treacherous, tight sheeting should be used. The lower end of this sheeting is generally "stuck" or driven below the bottom of the trench and the upper part driven between "wales" or "breast timbers." These run horizontally along both sides of the trench,

and cross-braces or screw-braces are placed between them and across the trench at intervals. When the sheeting is being prepared for driving, the bottom end, in addition to being sharpened, is cut bevel, so that in driving it will be forced close to the last sheeting in place.

There are several designs of interlocking metal sheet piling used in the relatively deep excavations, and there is also one well known wood type called "Wakefield" sheeting. These are generally driven by a pile driver, sometimes in advance of the excavation being made. If properly used they will hold out running sand and are practically water-tight.

WET TRENCHES AND WATER-BORNE SAND

Slight water leaks in a sheeted trench are permissible. In trenching wet ground, drainage should always be provided. An outlet for the water should be made to a sewer, if possible, or a sump should be constructed and a pump installed to raise the water out of the excavation. This water should be drained, by some means, to a place where it will not return to the excavation. The main thing to guard against is sand leaks. If the sand is carried by running water through leaks in the sheeting, a hollow space will be formed behind it, causing the bracing to loosen and drop out, which will be followed usually by the trench caving in.

Bracing or sheeting should be put in place without delay. An earth bank of firm material, if properly and tightly braced, will retain the cohesion between its particles for a considerable period. This explains why a trench, braced in a practical and perfectly safe condition, takes less material to do the work than would be used if customary engineering practice had been followed in making an estimate of the same.

SHORING, NEEDLING AND UNDERPINNING

When excavations are made adjoining an existing building that must be kept safe and undamaged while the excavations are made, shoring, needling or underpinning are resorted to. Shoring consists of using heavy inclined posts or timbers to carry a portion of the load. The lower end usually rests on a timber platform, while the upper end is fitted into a hole or slot, cut in the wall to be supported. The lower end of the "shore" is generally fitted with a jackscrew to tighten the shore and take-up settlement.

Needling consists in cutting holes through the wall, inserting a heavy timber or I-beam, and supporting it on cribbing on both sides of the wall.

It often happens that only one side of the wall is available for use. In this event it is customary to support the wall by some form of what is called the "figure four" method. This consists of using the needle as a cantilever by supporting the wall on one end of it. The needle itself is supported by cribbing, and the opposite end, when the upward reaction takes place, is held down by placing upon it a drum with a jackscrew at the lower edge of it. The upper end of the drum is let into a notch in the wall.

When the excavation does not extend much below the adjoining building, the wall is often supported by short drums. A horizontal section of the wall is taken out a short section at a time, and short drums with jackscrews are placed immediately. When the entire wall is thus supported the jackscrews take up any settlement in the old foundation; after completion of building and all settlement has stopped the jackscrews are removed a few at a time and masonry is rebuilt into the walls.

The term "underpinning" in a strict sense of interpretation means extending walls of existing buildings to a lower level by new walls or foundations under them. This work and bracing incidental to it has been developed as an engineering art, being done principally in New York, Chicago and Boston.

PROTECTION OF ADJOINING PROPERTY

In the matter of adjoining buildings of different ownership and on different premises, complications often arise. The law in the state of Illinois requires an owner in such a situation to protect and take care of his building. This has been the rule and it is always followed. However, where the property adjoining an excavation is unimproved it must be kept secure and protected by the party making excavation, the legal theory being that you are entitled to support for virgin soil, but not to the support of any load you may impose on the soil. Loading your ground with, for instance, a building that must not be disturbed would place a limit on the use of the adjoining property, whereas the law provides that the adjoining owner is entitled to the full and unrestricted use of his property. This permits him to go deeper with his foundation than you have gone with yours.

Notice is generally given by the contractor to the owner of the building adjoining, to protect his building. It is advisable to have the same contractor support and underpin the adjoining building to avoid friction between owners and contractors. But where another contractor is engaged to do the work and he cannot get permission to go onto the premises in the possession of the first contractor, he is often required to do all the work under the most adverse conditions. In fact, often it is found impossible to do this. Then the situation resolves itself somewhat like this. The owner of the existing building refuses to do anything and the contractor on the new building proceeds with the excavation until the existing building is endangered of caving in. The Building Department then steps in and in the interest of public safety "stops further work" to protect the workmen in the excavation, as well as the

occupants of the existing building.

If an agreement is not reached at this stage, law suits or an endurance contest between the owners generally ensue. Cases are on record where the long delay preceding the resumption of work has brought about conditions making it necessary to take down existing buildings, causing great loss of property and valuable time, all of which could have been avoided by the exercise of a little tolerance and judgment by the parties at issue.

Many involved problems arise even when there is complete cooperation of all interests, such as in the excavation of an entire tract 150 feet or more square, for a basement and subbasements. Here the street with both its surface and subsurface improvements, as well as its traffic, must be supported.

Adjoining buildings must also be underpinned, and the bracing of the excavation must be so arranged and of sufficient strength as to permit the use of a steam shovel, or to support a clamshell digger. Often pile drivers must be supported and operated on the bracing arrangement, as well as concrete equipment and materials used during the work of building retaining walls to grade level.

On the Marshall Field Building in Evanston, Ill., erected in 1930, the contractor made a radical departure from the customary methods. The excavation was 216 x 80 x 16 feet deep, on a corner lot. Streets had to be supported on the east and on the south sides, and on the north side a moving picture theater was underpinned, permitting it to be kept in operation throughout the progress of the work.

The excavation had to be sheeted tight. Instead of driving water-tight sheeting before excavating, the bracing system was placed on the ground at the bottom of the excavation, and a system of shoring used for the midway support. This allowed the use of a steam shovel and a pile driver with little or no interference. The procedure was as follows:

The steam shovel was put into the lot and it excavated for the full depth, starting at the rear end of the lot, leaving a sloping bank of earth on the street side. As soon as there was room the first cross timber was laid down. A little later the second set was laid down and so continued until the lot was covered. Then a section of the sloping earth bank was dug away, and a wale or breast timber was put into position against the earth bank and held there with drum shores, the lower end of the shore being secured against the cross timber and the upper end against the breast timber. Sheetings were placed behind these timbers to hold up the earth banks and driven down and as the excavating of this bank proceeded, a second waling timber was placed at the bottom level. At the opposite side of the excavation the breast timber and lower wale timber were placed against the wall of the theater building, the appearance of the bracing being somewhat like an inverted truss. The method was devised for the purpose of getting away from an excavation full of cross timber bracing and giving the maximum of space for building operation, and with the exception of a few minor changes it worked out perfectly. The theater wall was underpinned as a separate proposition, and the work on this fitted in perfectly with the general scheme.

(Continued on page 56)

Construction Details

of a

Creosoted Timber and Piling River Pier

Important Water Terminal

on the

Cape Fear River

Below

Wilmington, N. C.

ONLY recently the water terminal located on the Cape Fear River below Wilmington, N. C., which was begun early in 1929 by the National Oil Co., was completed. The project necessitated considerable pier work in addition to the storage structures on land. The pier, which is constructed of creosoted pine piling and timbers throughout, is built in the shape of the letter T. The stem portion of the structure extending from the shore line out to the T-head is 600 feet in length by 10 feet in width, while the T-head at the outer end is approximately 22 x 30 feet in size.

The 600-foot stem section consists of 41 two-pile bents spaced 15 feet center to center. The caps are 12 x 12 inches in size and 10 feet long. Five lines of caps support the 2 x 10-inch decking. Each bent is sway-braced with two pieces 3 x 10 inches x 14 feet and alternate spans are cross-braced longitudinally with pieces 3 x 10 inches x 18 feet to form towers and thus insure longitudinal rigidity.

In the construction of the T-head, three-pile bents were required, each supporting two 6 x 12-inch clamp caps 22 feet in length. Each pile bent is sway-braced with 3 x 10-inch timbers and the bents were driven on 10-foot centers. The three bents are tied together at the water line with two 3 x 10-inch x 32-foot pieces and bolted through the piles to the back and the middle line of the bents. At the inner end of each bent a batter pile was driven. This pile was framed and fastened to the inner pile of the bent. The batter piles were cut off 12 inches below the bottom of the clamp caps and a 12 x 12-inch timber framed so as to fit tightly between them. The projecting 6 x 12-inch clamp rests on top of these batter piles and is securely bolted through the vertical piles to which the bent piles are fastened.

Stringers on the T-head are spaced 2 feet on centers. The outer lines are 6 x 12 inches in size, and the intermediate lines 4 x 2 inches. The decking used on the



Photo courtesy of Wood Preserving News, Chicago, Ill.

The Creosoted Southern Pine Piling and Timber Pier 600 Feet Long and with a 20 x 30-Foot T-Head on the Cape Fear River Near Wilmington, N. C.

T-head is also 2 x 10 inches in size, but 22-foot lengths were required. The upper and lower lines of wale timbers are 12 x 12 inches in size, and outside of these was driven a creosoted fender pile at each bent to protect the face of the pier. Between the fender piles were fitted upper and lower 12 x 12-inch fender chocks.

THE MOORING CLUSTERS

In addition to the pier proper, there are eight lines of mooring clusters located on a line with the face of the T-head or outer end of the pier. Six of these clusters contain 13 piles and the two adjoining the corners of the pier contain 24 piles each. All cluster piles are 75 feet in length, and untreated. About 100 feet back of this line of clusters is another line of four containing 18 piles each, 60 feet in length. The clusters are securely wrapped with six turns of 1-inch galvanized rope and fastened with staples.

All timbers in the dock is southern yellow pine treated according to standards of the American Wood Preservers' Association with 12 pounds of Grade 1 coal-tar creosote per cubic foot. The piling also is of southern yellow pine, treated with 16 pounds of creosote per cubic foot.

In the construction of the pier, the pile lengths varied from 30 feet on the inshore end to 70 feet on the deep-water end of the pier. More than half the piles, however, averaged more than 50 feet in length.

PENETRATING THE ROCK STRATA

The site is underlain with rock strata, some of them extremely hard. In certain places three distinct strata occur, with mud or sand intervening. These strata vary in thickness from 2 to 8 feet and the separating layers of soft material from 6 inches to 2 feet. On the in-shore section the overlying formation was sufficiently deep to provide sufficient penetration for the piles without penetrating the rock strata. For the remainder of the work, however, these strata had to be penetrated, and for all excepting a few of the in-shore bents the piles were set by drilling holes through the underlying rock strata. Holes were drilled through the full depth of the rock with an ordinary steam-operated well drill mounted on a barge.

In the case of the dolphin clusters a hole was drilled in the center to the full depth of the rock. This hole was then loaded with 200 pounds of 60 per cent gelatine dynamite. The water was about 30 feet deep and the current of the tide very swift. It was occasionally difficult to determine the extent of the breakage which resulted from blasting. It was sufficient in all cases, however, to form a hole from 8 to 10 feet in diameter. The cluster piles were then driven into this hole, and while some of the rock was thrown out around the edge of the hole a considerable portion of it was broken up without actually having been displaced. Part of it was punched down in driving the pile and some was wedged between the piles so that a noticeable tightening up took place as the work progressed, and the driving became correspondingly harder for the last few piles set in each cluster.

BLASTING AND DREDGING THE CHANNEL

In the basin proper, channel depths varied from 23 to 33 feet at mean low tide. The channel in the river is only 26 feet deep at that stage, but it was desired to

make provision for bringing in vessels drawing 28 feet. These ships could be moved up the river at flood tide, but the basin between the pier head and the channel had to be deepened to 30 feet at mean low water in order to provide a safe berth for large vessels at all stages of the tide. Through this dredging, section holes were drilled and the rock was blasted by dynamite, after which it was picked up with clamshell or orange peel buckets.

For the blasting, holes 8 inches in diameter were drilled every 10 feet both ways over the area. The blasting was done at each hole before the drill was moved to the next point, thus eliminating any possible delay resulting from failure to locate readily the holes through the deep water when it was desired to place the explosive.

All work was done by Carpenter & Petrie, contracting engineers, of Norfolk, Virginia, to whom we are indebted for the above data.

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TRENCH CONSTRUCTION BRACING

(Continued from page 54)

PRINCIPLES INVOLVED WHICH PREVENT ACCIDENTS

There are several well grounded principles that have been deduced that have equal application in nearly all cases and tend to prevent accidents in this class of work. A few of them may be stated here:

A railing should be placed around the excavation in such a manner that passers-by or idle and curious persons cannot get in the way and be injured. The material used, and lumber especially, should be of the best quality. Old scrap, discarded or poor quality lumber or other material should not be used.

The problem should be studied and a plan formulated for going through with the work.

The men employed should be the most skillful that can be procured. This is obvious when we realize that most of the work is carried on in close or cramped places where only one or two men can work.

Tools and other loose equipment should not be left lying on braces or scaffolding as they may be knocked off and injure someone working below.

While most of the workmen who follow this class of work are experienced and careful, an occasional talk on "Accident Prevention" will always be beneficial.

Finally—one must not expect a cheap unreliable contractor, who has put in a very low bid for the work, to put any of his money into it in order to complete it. As in everything else, we get about what we pay for. And where a single failure will mean so much in loss in life and property, it is the greatest economy to entrust the work to a reliable, experienced, and skillful contractor.

ACKNOWLEDGMENT.—From a paper presented before the Construction Section of the National Safety Council at the last Annual Safety Congress.

Heavy grading in West Virginia, hot-mix paving in Western Ontario, tandem paver operation in Minnesota, resurfacing a main highway with brick in Illinois and replacing a main line railroad bridge under traffic in Maryland, are features of the leading articles scheduled for the January issue of CONTRACTORS AND ENGINEERS MONTHLY.

A

Well-Planned

Gravel Pit



Dumping the Skip Car

*Towland Construction Company Produced All Aggregate
for Its 8-Mile Concrete Paving Project*

South of St. Thomas, Ontario

A 5-MILE concrete paving job that became an 8-mile job made the excellent gravel plant location and set-up of the Towland Construction Co., Ltd., unusually low in operating cost. The pit was located 3 miles south of St. Thomas and the job ran 5 miles south of the pit to Port Stanley on Lake Erie. The original plan of operation included a drag scraper in the pit to pull the bank material to the crusher, which did not work out entirely satisfactorily, and a Koehring 1½-yard shovel was substituted, greatly speeding up production.

The shovel worked against a face of about 12 feet and dumped into a 4-yard car which was hauled up a slight incline on rails to a hopper by a LeRoi-powered hoist. At the hopper the car was emptied and the material fed from the hopper forward by an oscillating feeder to a Galion belt conveyor with metal skirt boards. At the top of the 30-foot conveyor the material dropped back through a metal chute and over a bar grizzly through which the sand and all the stones less than 2 inches in diameter dropped, the larger material going into the 12 x 20-inch Sawyer-Massey jaw crusher. The material was then raised by a bucket elevator to a 42-inch circular screen and washer. A small Viking pump in the nearby wash water waste pool and a C H & E 5-stage centrifugal in a large lake about a half-mile away furnished the 500 gallons of water per minute required to produce a clean aggregate. The stream of water from the Viking pump was used to rinse the stone as it dropped from the end of the screen to the hopper which fed into a 60-foot Barber-Greene conveyor which in turn carried it to the stockpile.

The sand which went through the screen to the outer jacket dropped into the Godrich Champion washer and was well scrubbed before being delivered to the second 60-foot Barber-Greene conveyor which carried it to the sand stockpile. The water from the sand washer instead

of being tapped off at the middle was carried off at the back or farthest point from the delivery end of the sand, insuring a maximum of cleanliness.

The operating crew at the sand and gravel pit included the shovel operator, a man on the skip car and the hoist operator for the car, two men dumping the car at the hopper, one man at the lower end of the Galion belt conveyor taking off the largest stones that were above the capacity of the crusher, one man at the grizzly keeping the bars clear and watching the crusher and two men on the stone conveyor watching for oversize or poor stone. Immediately over the crusher was a strip of sheet metal to stop flying fragments of stone or whole cobbles that might pop out unexpectedly.

A Koehring 301 crane with a 1-yard clamshell bucket kept the wooden bins of the Johnson batchers filled from the two adjacent stockpiles. The aggregate was measured by volume for the 1:2:3 batch with eight bags of cement. The one-batch trucks backed under the batcher, received the sand and gravel and drove ahead onto the road and to the cement truck and platform where two men tossed on the eight bags of cement which had already been cut. Cement was hauled by the contractor about one-half mile from a siding where two men loaded the two hauling trucks from the cars. The contractor had eight of his own Ford trucks hauling batches and a maximum of ten hired trucks on the longest haul of 5 miles.

HANDLING THE CONCRETING ON THE ROAD

The grading necessary on the road was all handled by an Adams No. 10 power grader. The subgrade was well-compacted with a Waterous 15-ton roller ahead of the paving and between the forms which were set 500 to 1,000 feet ahead of the paver and for the full 20-foot width of the pavement. Blaw-Knox 10-inch forms were used for the 10-7-10-inch section. This section required

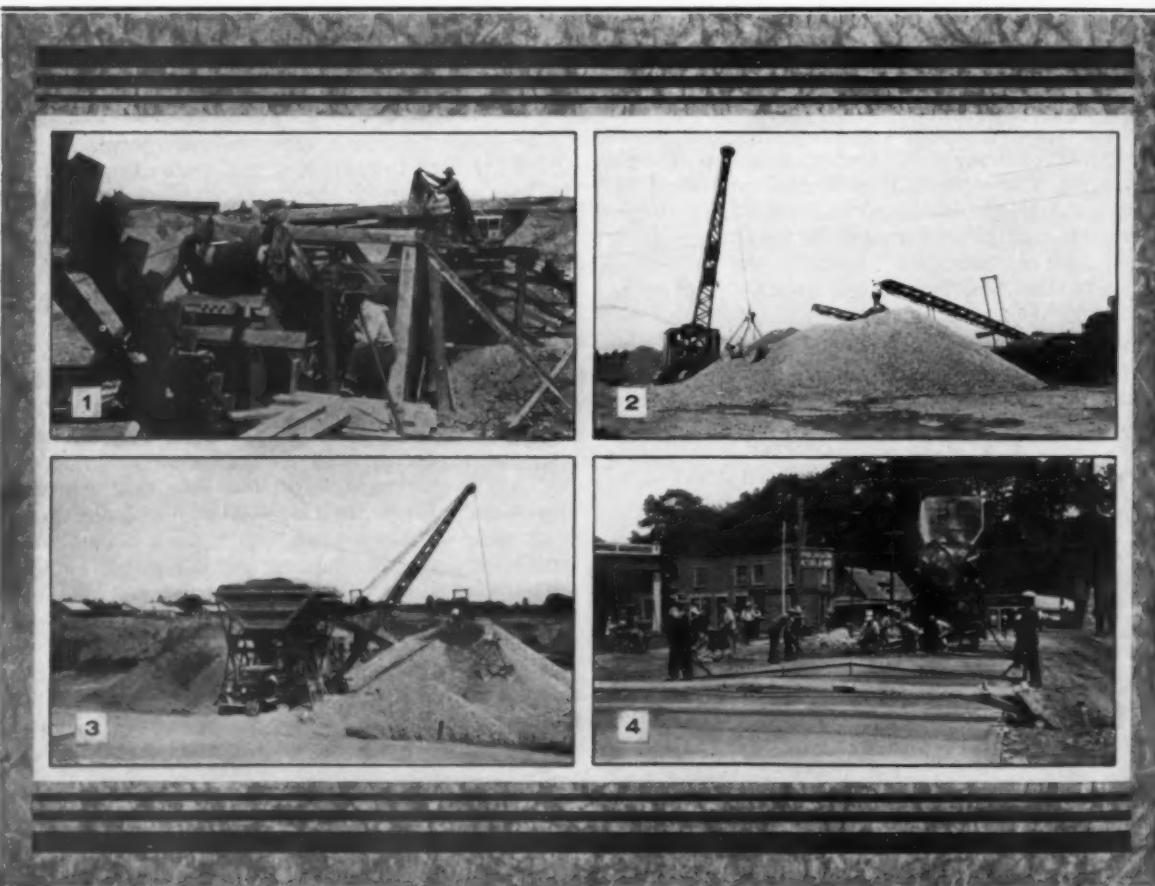
a full 10-inch thickness reducing to 7 inches at a point 3 feet from the edge and then the full 7-inch thickness for the remainder of the section until it again thickened at the corresponding point on the other side. The pavement has a 1-inch crown.

There were four men on fine grade and two form setters. The batch trucks turned on a Blaw-Knox turntable. Before dumping, the cement bags were emptied on the batch by two men who also packed up the empty bags for return to the pit. One man dumped the trucks and saw that the bodies were completely empty before the truck left the paver skip. The operator for the Koehring 27-E paver cared for the machine, oiling and greasing it at regular intervals. There was one man setting the Truscon center steel who also trimmed the grade and was assisted as required by the man who oiled the forms ahead of the paver. The center steel was staked with six pins per 5-foot length and held in position in the center of the pavement by a temporary bar from one of the forms.

There were three puddlers and two screeds with two men for each screed. Instead of the more common wooden screeds which are very heavy and awkward to handle, the contractor used two screeds made specially of channel iron sections, the first being 6 inches wide and

the second 4 inches. The second screed was very light but strongly made with long braces from the handles to increase the rigidity of the screed. This screed was especially made to be easily handled and to use continuously instead of for short stretches as in the case of the first and heavier screed. The principle of the second screed was that it would be used both forward and back over distances of as much as 75 feet without stopping. Thus it would iron out any ridges left by the starting and stopping of the heavy screed. This theory seemed to work out quite well on this job as the pavement that had been opened seemed to ride very smoothly.

Following the two screeds were the two finishers who used the two 6-inch composition belts and edged the pavement. There were two men placing the burlap for over night and sprinkling it and then two men made up and spread the sodium silicate solution the following day. This is understood to be the first 1931 job in Ontario that used the sodium silicate method of curing, thus eliminating the more common earth cure that is used almost entirely throughout the Province. An oil drum in which the silicate solution normally was made up was used to soak the burlap before applying while the contractor was working within the limits of Port



PRODUCTION AND USE OF AGGREGATE ON A SOUTHERN ONTARIO CONCRETE PROJECT

1. The 30-foot conveyor handling the gravel and sand from the crusher to the bar grizzly.
2. The two 60-foot conveyors delivering aggregate to the stockpiles from which it was rehandled to the batching plant by the Koehring crane and 1-yard clamshell bucket.
3. Truck No. 5 receiving its single batch of aggregates proportioned by volume.
4. Finishing the slab behind the 27-E paver with two hand-operated steel screeds.



A GENERAL VIEW OF THE TOWLAND CONSTRUCTION CO. GRAVEL PIT

At the extreme left is shown the larger skip car which was used during the latter part of the contract. Next is seen the smaller skip car about to be dumped, then the 60-foot washed sand conveyor, the bucket elevator from the crusher to the screening and gravel washing plant, the 60-foot gravel conveyor and the crawler crane for handling both aggregates to the bin and batchers.

Stanley and was using city water. Usually he required that the burlap be spread on the shoulder and be wet down before applying, but this process would have been a bit out of order when using city water.

The paving crew averaged 100 feet an hour for most of the work and ran as high as 125 feet per hour for long periods. Water for the work beyond city limits was furnished by a C H & E triplex pump through a 2-inch pipe laid along the shoulder with taps every 400 feet. The paver carried 250 feet of 2-inch hose with the length nearest the paver being 2½-inch because most of the wear and chance of kinks comes in that section.

PERSONNEL

The Towland Construction Co. of Guelph, Ontario, was the contractor for the project. H. E. Macpherson was Resident Engineer for the Ontario Department of Public Highways.

Getting Iowa Further Out of the Mud

INDICATIVE of progress in road construction and maintenance is the story of Iowa. From a primary road system which eleven years ago was 77 per cent unimproved and 90 per cent unsurfaced, it has progressed to a primary road system which is 90 per cent surfaced and only 7 per cent unimproved.

All of this has been accomplished without taxing real property. The receipts from motor license fees, gasoline tax and Federal Aid have already paid for 60 per cent of this construction cost. Only 40 per cent is represented by bonds now outstanding. The total construction expenditure of this State in the past eleven years amounts to \$225,000,000 of which current funds have paid \$129,000,000, leaving only \$96,000,000 represented by bonds. In 1920 the motor license fees going into the primary road fund amounted to \$6,724,000. There was no gasoline tax. In 1931 the motor license fees and the gasoline tax going to the primary road fund amounted to about \$17,000,000. In eleven years Iowa has built a new road system which is paying for itself in increased earnings.

In the last five years 3,380 miles of roads have been paved, an average of 676 miles a year and in the last five years

pavement has been built in Iowa which would reach from New York to San Francisco.

Iowa is fast getting out of the mud!

Estimated 1932 State Highway Construction and Maintenance

THE following estimate obtained by the American Road Builders' Association from State Highway Departments on state highway construction and maintenance mileage for 1932 is a preliminary indication of the character and volume of work to be expected next year. Information has been received from 38 states, more or less complete. The remaining states have not yet completed their 1932 schedules.

1932 ESTIMATED STATE CONSTRUCTION AND MAINTENANCE MILEAGE

	Earth Improved	Sand-Clay, Gravel Macadam & Similar Types		Sand-Clay, Gravel Macadam & Similar Types		Asphalt, Concrete and Brick
		Unreated Surface	Treated Surface	Unreated Surface	Treated Surface	
Alabama	300	430		3900		175
Arkansas	100	800	200	5450	100	300
California	64	1980			119	2050
Colorado		1000	150	1500	150	500
Delaware	5		10		5	38
Florida	80	635		235	100	3175
Georgia	175	3000		500	125	825
Idaho	25	355	50	1694	600	906
Indiana				1800	150	1600
Iowa	350	732	675	3000	100	15
Kansas	550	3000	200	4000	400	500
Kentucky	300	400	375	2400	50	1850
Louisiana				3000		500
Maine		780 ¹	400	1690	35	2100
Maryland			35	160	40	1600
Massachusetts					95	255
Minnesota	500	85		3122	500	1900
Missouri	125	246	1500	3180	80	150
Montana	300	500	300	2000	300	800
Nebraska	1000	1200	1000	6200	100	150
Nevada		248	250	1064	275	722
New Hampshire				100	90	30
New Mexico	16	2600	133	1900	172	600
New York						780
North Carolina	150	18000		16000	150	2200
North Dakota	600	1917	700	4319	100	374
Oklahoma	250	2300	200	1200		500
Oregon	100	400	150	1050	100	1650
Rhode Island						132
South Carolina			150	2500	325	900
South Dakota	400	875	600	4050	300	200
Tennessee						40
Texas	1376	4912	210	5274	436	4069
Utah					250 ²	852
Washington	218		203		380	5
West Virginia	150	475	125	340	200	500
Wisconsin	100	800	400	2900	200	3000
Wyoming	300	297	525	1300	500	1400

¹ Unimproved. ² Total. ³ Gravel. ⁴ Oil Mix.

Concreting Can Continue

Despite Cold Weather

*The Experience of Contractors
on
Both Large and Small Projects
Shows That
Winter Work Is Profitable*

FREEZING temperatures this winter should not be permitted in any way to hinder the continuance of concrete and steel construction. The experience of contractors for over 20 years shows that with very slight initial cost and with an actual saving in the end contractors can, with proper safeguards, pour concrete in winter as satisfactorily as in summer. The extra equipment for cold weather concreting is very simple but no cold weather work should be attempted without it. This year there is added to the preponderance of advantages of winter concrete construction the argument that employment should in no way be further slackened. It has been true in past winters that labor, both skilled and unskilled, has been more available than during the height of the intensive construction season during warm weather. This year an even larger number of men are seeking wages so that contractors should in every way endeavor to handle more winter work than they have ever attempted before. Furthermore, owners and governmental units should pick this year to push winter construction with unusual zeal.

PRACTICAL RULES FOR COLD WEATHER WORK

Whenever concrete work may be continued into the winter season, the contractor should make definite provision, long before the arrival of cold weather, for the immediate assembly and installation of enclosing and heating equipment when the need for it arises. Since concrete should be placed at a temperature which will not delay the initial setting or hardening process, it is advisable to heat both the

aggregates, and the water. Simply heating the water, but not the aggregates, is not sufficient in freezing temperatures. The quantity of mixing water amounts to not more than 20 per cent of the total volume of the material and it is obvious that even though the water may be introduced into the mixer at a temperature close to the boiling point, the resulting temperature of the hot water and cold aggregates mixed together will be but a relatively small fraction of the temperature of the water.

If the temperature of the aggregates is below freezing, a certain amount of frost or ice will be present in it. This frost and ice and the cold aggregate will bring the resulting temperature of the mass below that at which the initial hardening will begin and progress normally. In order to insure the prompt beginning of the hardening process, the mass should have a temperature of not less than 60 degrees Fahrenheit, when introduced into the forms, but the temperature should not exceed 100 degrees Fahrenheit. The maximum temperature of the mass should not be such as to produce too rapid evaporation of the moisture.

Thermometers should be used to determine the temperature of the concrete as it is deposited in the forms and its temperature during the first five days after it is deposited. Recording thermometers are advisable in the building at several locations and especially on the windward side of the enclosure. Common thermometers should be used to test the fresh mass of concrete. Such thermometers may be obtained at an insignificant cost and they constitute an essential part of the equipment for cold weather concreting, because it is from the data given by them that the contractor has absolute knowledge as to whether or not the concrete has had an opportunity to harden.

Extremes of local climatic changes should be taken into consideration when providing the necessary equipment. The speed with which the work is to be carried on should also be taken into account in deciding on the capacity of the heating equipment and the amount of housing material. If the concrete structure is to be rushed, sufficient housing should be provided for at least three stories so that one story per week can be constructed.

The First of a Series

This article on cold weather concreting is the first of a series of articles which will outline in general the principles of handling concrete in cold weather, some of the theories and then practical methods which have been used by contractors, specific instances of outstanding jobs on which considerable concrete has been poured in winter and many cases where contractors consider cold weather work merely as a matter of routine.

(Continued on page 66)

Canal and Rail

Shipments

with

Industrial

Haulage

on

Western Illinois

Road Job

WHEN deliveries were on schedule through the Illinois-Mississippi Canal, also known as the Hennepin Canal, a part of the Federal System of inland waterways, the C. E. Carson Co. was able to maintain an average of 1,150 to 1,200 feet of slab in eleven hours. But a series of delays in getting the materials through the eight locks caused much loss of time in the construction schedule. Traffic on the canal is almost negligible but still the authorities were unable to expedite sufficiently the shipments of aggregates by barge to keep the paving outfit going continuously.

Limestone for the concrete was secured from the Linwood Cement Co. at Linwood, Iowa, and sand from the Rock Island Sand & Gravel Co., at Rock Island, Ill. Both of these producers loaded barges at their docks and sent them by tows promptly to the entrance of the canal where a towing company took them over and endeavored to put the deliveries through.

The 15.07-mile contract lay in the bottom lands between the Green and Rock Rivers where there is much blow sand, making it impossible to consider the use of trucks for the hauling of the batches. Consequently



Method of Strengthening Bridge Over the Green River by Hanging from Jetted Piles

C. E. Carson Co.

Forced to Strengthen Bridges

to Bring in Equipment

and Delayed by Poor Deliveries

Through Canal System

an industrial railway system was set up with the batching plant near the south end of the job close to Geneseo, Ill., and on the banks of the Hennepin Canal. Most of the equipment for the job was brought in by barge and it was necessary to strengthen two of the bridges, one over the canal and the other over the Green River, to insure the safety of the paver when pulling out to start the work.

The bridge over the canal was reinforced by temporarily placing a barge under the bridge lengthwise and bracing the structure to the deck of the barge. No permanent piling or other structure could be built in



One of the Wire Cable Slings on the Green River Bridge

the canal because it is classed as a navigable waterway although the traffic is almost negligible, according to local reports. The bridge over the Green River, which is not classed as a navigable stream, was strengthened by hanging the floor system from piles jetted into the stream bed. Twelve piles, six on a side, were driven from 5 to 8 feet into the bed of the stream by jetting, using the road pump located on the stream bank to provide water for the paver as the source of water

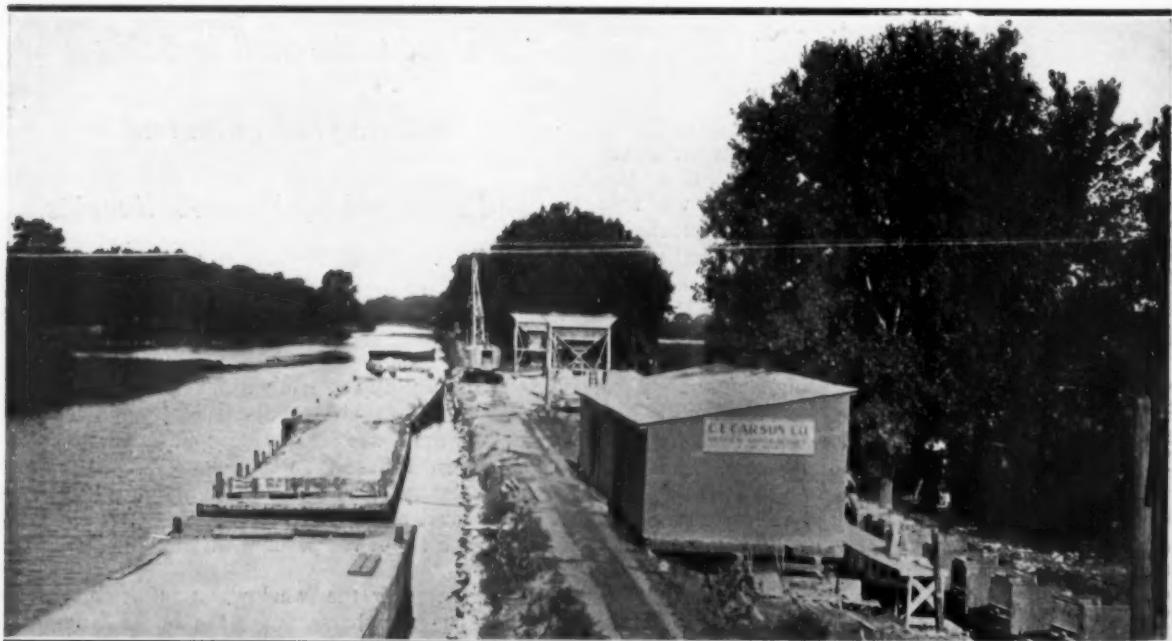
under pressure. The piles were held up by a tractor and sheaves and tackle hung from the top trusses of the bridge. Heavy wire cables were passed from the tops of the piles in the form of a sling under the ends of the floor beams and added to the strength of the structure sufficiently to insure the safety of the paver in crossing.

ROUGH GRADING

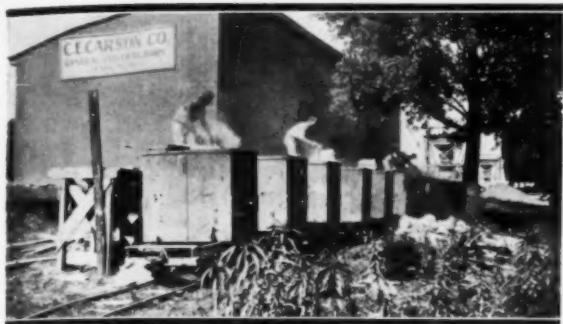
There was a total of 400,000 yards of excavation in the rough grading of this section on Route 82. All of the work was done by subcontract by H. H. Enbody & Son of Aurora, Ill., who used a power elevating grader on one part, a straight elevating grader on another section and a shovel outfit with crawler wagons. He subbed the work in the largest cut to Paul T. Pfeifer & Co. of Rock Island, Ill., who worked a shovel and crawler wagon outfit in the 43,000-yard cut. All of the grading involved a large amount of overhaul, the total for the entire job being greater than 1,000,000 station-yards.

PREPARING THE FINE GRADE

It was a pleasure to hear, for once, that the grading contractor left the grade in such good condition that the fine grading of the paving contractor was a minimum. A Monarch-75 with a Western 1-yard rotary scraper, and a Wehr power grader with an 8-foot blade aided by about nine men who worked both ahead of and between the forms handled all the fine grade work. A Ted Carr Formgrader cut the trenches for the forms where the sand was not too soft and four men, two setters and two helpers, set the Blaw-Knox 9-inch steel forms. As soon as the forms were set and aligned the tractor pulled a Carr subgrader over the grade and cut it true to form. It was then compacted with a Fordson 3-ton roller and remained in good condition until the slab was completed as there was no truck haulage to cut up the grade.



Barges of Aggregate Being Unloaded by a Crane on the Banks of the Hennepin Canal. The Cement House and Industrial Track Are Seen at the Right.



Emptying the Cement into the Batch Boxes at the Cement Dock. The Stone and Sand Batching Plants Are Seen at the Right in the Background.

THE AGGREGATE TERMINAL ON THE HENNEPIN CANAL

The batching plant was somewhat out of the ordinary because of the conditions imposed by the barging of the aggregates instead of the more common handling of the material from gondola freight cars or delivery direct to the stockpiles by the material men's trucks. As mentioned before, both limestone and sand were brought in by barge. These barges were tied up along the canal close to the right of way of the highway and were unloaded by a P & H 206 crane with a 40-foot boom and a $\frac{1}{2}$ -yard Kiesler clamshell bucket. The two Blaw-Knox single batchers, one for the stone and the other for the sand, were located a considerable distance apart in order to permit the tying up of two aggregate barges at the bank at one time. The distance between the batchers was a full 150 feet. This made it rather difficult for the crane to keep both the bins supplied when twenty-five batch boxes were filled at a time. The size of the bucket was probably a little too small for the work but the craneman did fine work and kept moving from one barge to the other to fill first the sand and then the stone bins.

The batches consisted of 2,090 pounds of stone, 1,350 pounds of sand and 6 bags and 36 pounds of cement. The odd weight was made up on the cement dock and put into sacks which were spotted with the 6-bag piles for the trains. The industrial trains were made up of four cars behind the locomotive and sixteen ahead with a total of twenty-five batches per train. Koppel and Western cars were used with Koppel boxes. As some of the cars were not large enough for the two batch boxes, these were loaded with only one box so that a full train carried only twenty-five boxes. The locomotive equipment consisted of one 3-ton Plymouth which was used for moving forms and rail, one 7-ton Whitcomb, two 6-ton Whitcombs, and a 6-ton Plymouth with friction drive.

Cement for the job was at first brought in by barge but the system was quickly changed and delivery was made by freight to Geneseo at the end of the job and about 2 miles from the batching plant. The cement was hauled in by contract by two trucks and delivered to the cement dock and unloaded direct to the trains if one was waiting; otherwise the bags were placed in storage in the 75 x 30-foot wooden storehouse.

The labor organization at the batching plant consisted of: two men on the barge being unloaded, one crane man, one batch man who with the spotter who

dumped the batches ran from one batcher to the other as soon as the train had received the first aggregate, and six men in the cement house. The bags of cement were brought out from the shed or from the trucks by hand truck and stacked in the approximate locations for the twenty-five batch boxes with the extra part bag alongside. Dewey cement from Davenport, Iowa, was used. The batch weights were changed as frequently as three times a day, according to the aggregates received, the weights given being those for one day which serve to show the approximate proportions.

A large gasoline tank at the batching plant was supplied daily with fuel by the Sinclair Refining Co. and all equipment was gassed by the contractor from this tank. Gasoline for the paver and other equipment on the grade was carried out in 50-gallon drums on the batch trains. The industrial railway was also used to move the forms, rails, reinforcing steel and burlap. When moving track, in order to permit the cars each to hold a pile of sectional rail laid lengthwise of the car and allow turning on curves, pipe spacers were used in 10-foot lengths attached to the regular couplings. To permit night work in pulling and moving forms Milburn hand-type carbide lights were used along the slab.

Switches for the industrial railway were set at convenient intervals to permit the passing of the full and empty trains. When a train had emptied all its batch boxes it pulled beyond the paver to the next switch. The full train then came up and left its four cars pulled behind the locomotive and then went down the main track beyond the empty on the switch. The empty then pulled in on the main track, picked up the cars left by the full train and which had been emptied during switching, and proceeded back to the batching plant.

After between 6 and 7 miles of the project had been paved out from Geneseo, it was found uneconomical to haul to the balance of the job by industrial railway. Therefore the contractor continued to unload materials at Geneseo but hauled them by truck over the new pavement and established a new proportioning plant at the roadside about 7 miles from Geneseo. At this point the materials were stockpiled, transferred by crane into the proportioning bins, loaded into industrial railway cars and hauled by rail from this new proportioning plant location to the actual point of laying concrete.

POURING THE 9-6-9-INCH SECTION

Immediately ahead of the paver the forms were straight-edged by the inspector after they had been hand-tamped by two men of the fine grade crew. A master straight-edge made of a 6-inch I-beam machined



The Man Setting Steel Carried Enough Side-Bar Chairs in a Wheelbarrow to Last Him a Day



Method of Spacing and Supporting the Center Steel

to a perfect surface was carried on the finishing machine for checking all the straight-edges used on the job. Particular care has been taken on all Illinois jobs this past season to straight-edge all work frequently, as the contractors were penalized one square yard of pavement surface in the final estimate for every "bump" found in the surface by the machine, which allowed a tolerance of $\frac{1}{8}$ -inch in the surface. This was run four times along the slab the day following pouring, in the approximate location of the paths of automobile tires.

The $\frac{3}{4}$ -inch side bars were set by one man just ahead of the paver and carefully oiled to prevent bonding of the concrete and the steel. These were held 6 inches from the side and 6 inches from the bottom of the finished slab by steel chairs. The man setting these bars used a wheelbarrow on the grade to carry his steel chairs so that they were always handy and in sufficient quantity to last him for the entire day's run. This same man also oiled the forms ahead of the paver.

The Rex 27-E paver pulled a Carr subgrade planer from which two men shoveled the excess dirt. The batch boxes were lifted from the cars and dumped by two men with one man on the paver hoist. Immediately behind the paver one man sprinkled the grade and then the steel man set the Truscon center steel to form the plane of weakness along the center line of the slab. The center strips were 10 feet long, and were held in place temporarily at one end by the previous section and at the other by a spacer bar from the forms with double prongs that fitted over the forms and a single loop over the steel. Four 14-inch stakes of $\frac{1}{2}$ -inch dowels were used to hold the center steel. Dowels $\frac{1}{2}$ -inch in diameter were run through the center steel on 5-foot centers and held in place by wire chairs which



Stamped Metal Chairs Supporting the Side Reinforcing Bar

the steel man carried in some quantity stuck into the timber of the subgrade planer. The dowels were 4 feet long.

Two puddlers and one spader working both sides handled the concrete behind the paver. They were closely followed up by the Ord two-screed finishing machine. Three hand finishers handled all the final work in producing the smooth riding slab. They first worked a 12-foot longitudinal float from a Carr double rolling bridge, then a 10-foot checking straight-edge, then, if necessary, the 5-foot long-handled floats, then the 6-inch belt and lastly the edging along the forms. In using the longitudinal float the men worked it from the center out each way with one pass only, then moved the bridge along 6 feet and repeated with a lap of one-half the length of the float.

Two men carried the burlap on a Carr bridge and spread it behind the finishers. They also sprinkled the burlap and spread the Dowflake calcium chloride on the previous day's run, using an A. E. Thompson & Sons two-wheeled spreading machine.

WATER SUPPLY FOR GRADE, PAVER AND BURLAP

The water supply for the job was furnished by a C H & E No. 11 triplex pump which was located at the convenient water sources beginning with the Green River. The 3-inch pump delivered the water to a $2\frac{1}{2}$ -inch pipe line laid along the shoulder on the opposite side from the industrial railway track. Taps for the 150 feet of $1\frac{1}{2}$ -inch paver hose were placed in the line at intervals of 240 feet. Three 1-inch hose were used for sprinkling the grade and the burlap.

PERSONNEL

This contract for the construction of Section 129, Route 82, running north and east from Geneseo, Ill., for 15.07 miles of 9-6-9-inch pavement, 18 feet wide, was completed, after some trouble with the delivery of aggregates through the government canal, by the C. E. Carson Co. of Chicago, Ill., for which J. Ward Nelson was Superintendent. R. H. Scales was Resident Engineer for the Illinois Division of Highways.

Bulk Cement from Barge to Bin

(Continued from page 52)

the extra man who managed the gate on the loading hopper on the dock; on the Bucyrus-Erie, the crane-man, a fireman and a pit man; and on the Erie Aggrometer, a man weighing the two sizes of stone and one weighing cement. The batches for the paver were weighed out as follows: 1,107 pounds of 2-inch crushed stone, 1,107 pounds of $\frac{1}{2}$ to $\frac{3}{4}$ -inch crushed stone, 1,426 pounds of sand, and 658 pounds of cement.

PERSONNEL

The contract for the construction of the new concrete road through the West Point Reservation was awarded to the Lane Construction Co., of Meriden, Conn., for whom E. A. Pixley is Superintendent. For the United States Army the work was in charge of Major C. D. Hartman, Quartermaster, West Point Military Academy, and his assistant, Lieutenant John B. Franks, Q. M. C., U. S. A.

The Contractor's

Battle Map

By

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Certified Public Accountants
New York City*

BTAINING a contract or a job as a successful bidder is one thing. Successfully concluding the job is another—and the most important. Failures or successes depend entirely on efficient supervision from a managerial standpoint.

Too often a contractor, having obtained a sizable job, becomes lost to the responsibilities of the contract and assumes the attitude of trusting to good fortune. It just isn't in the cards to win through carelessness. It is a direct loss to have profits dwindle where proper action could have enhanced them.

As an example of this the writer recently reviewed a completed contract upon which there was a resulting net profit of over \$210,000. The contractor was jubilant over the result until it was pointed out that he could have netted an additional \$83,000 through the adoption of several logical moves which should have been made during the progress of the work. Lost earnings are just as surely losses as actual cost excesses.

Probably no other means serves so well to plan constructively a decisive battle as that of giving initial proper consideration to the utmost detail. Probably no other means serves so well to win decisive battles as to take advantage of every break as the battle progresses.

MAPPING OUT A PLAN OF ACTION

The contractor's estimating bid sheet is his summary of the proposed battle situation. He has made plans generally to conform his actions to this summary. Failure on his part to check constantly actual results against bid or estimate summaries as the work progresses would be similar to an Army General who plans his offensive, starts it at the appointed zero hour, and promptly goes back to bed. The General is court-martialled, the contractor goes broke, both ignominiously going down in defeat, or half-way success which is just as bad, and both are deemed incapable.

The contractor's estimating bid sheet is his battle map. Should he discard it, as most do, when the battle starts? Or should he really keep it before him and plot in upon it the advance of the forces he has marshaled to win accomplishment and merit?

The answer is obvious. The writer has in mind a nationally known contracting and engineering firm who actually carries upon the walls of its estimating department a so-called battle map of each contract in progress. These progress maps are deemed of so much import, that each week, after all statistical recording is completed, pictures are taken of the completed maps, and sufficient prints are made so that each officer and director is supplied with the complete series for the weekly meeting of the directorate.

The map or maps referred to are placed upon the wall the day the contract is awarded and are not removed until the job is concluded. The estimate which obtained the job is written onto this battle summary, in component parts with their corresponding estimate amounts. Daily or weekly the accumulated expenditures (Paid for and Owed) are written in, opposite each section of the sheet in comparison with the original bid figure. The stage of completion is next indicated. Following this is a column for Probable Savings or Losses on Original Estimated Elements. A column provides for Completed Cost and another for Actual Savings or Losses on Original Estimated Elements. Two further columns provide for Amounts Due Contract Creditors and Amounts Due Subcontractors. Further columns provide for Due Currently on Requisition and Retainage Withheld To Date.

This really provides a comprehensive analysis of the contract progress, its possible termination result, and a statement of the financial status, not only by totals but by elements of the job.

To indicate this more fully the following draft is suggested, which may be varied to meet the individual needs of various organizations:

This is the concluding article of a series which has appeared monthly during 1931, covering tax, accounting and system problems as applicable to the contractor.

Elements of Contract	Bid Estimate	Accumulated Expenditures	Stage of Completion	Probable Savings or Losses	Completed Cost	Actual Savings or Losses	Amounts Due Creditors	Amounts Due Subcontractors	Due on Requisition	Retainage Withheld to Date
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The set-up is in the form of a blackboard and the data, obtained from the accounting department or records, are plotted on in chalk so that they may be changed constantly. Red chalk is used to indicate possible or actual excesses in costs as against original estimates. Extras are plotted in as additional elements to be accounted for. Naturally the appearance of red figures are danger signals, weaknesses in the line that must be strengthened at these particular points or successes planned at other points that will overcome these setbacks.

Attention to details is a matter that can be delegated to subordinates but it must be remembered that no Corporal ever won a war. United and effective effort only comes through a sensible direction of the forces at hand, based constantly upon a sound grasp of the entire situation with its attendant continuous changes.

Concreting Can Continue Despite Cold Weather

(Continued from page 60)

METHODS OF HOUSING

Tarpaulins of canvas are the most convenient housing material to use. They should be available in sufficient quantity to provide a tight connection at the lowest floor housed and to cover completely the last

floor cast and allow ample room between the canvas and this floor for positive circulation of the heat. It is not enough to insulate the top surface of a green floor and expect that floor to be warmed throughout its thickness by absorption of the heat through the slab. Canvas should be carried entirely outside of the limits of the new floor slab so that heat can pass up to the top of the floor. In addition to this, temporary heat openings should be provided in the floor at the mid-point of the panels so that the warm air may pass directly to the top surface of the slab.

SUPPLYING HEAT

The use of salamanders for supplying heat is very common. They must be fired regularly and with high grade fuel. The gases of combustion and smoke as well as the ashes produced by coke-fired salamanders are troublesome. The newer salamanders with fuel oil torches are more effective and when equipped with some device for evaporating a reasonably large quantity of water into the air offer an admirable method of supplying the heat and moisture needed for curing.

In cold weather live steam is usually necessary for thawing out aggregates, for heating water and for many other purposes on the job. It appears that steam provides about the best form in which heat may be supplied for curing. The only objection to the use of steam heat is the necessary piping, but since the steam is used at a low pressure the piping need not be perfectly tight and the lightest weight of pipe obtainable may be used. Steam should be allowed to escape within the enclosure to provide moisture in the air and on the surface of the concrete.

Heating aggregates may be done over a grillage of steam pipes or by piling the aggregate over pipes and maintaining a wood or oil torch fire within. A convenient method of heating water for concrete is by means of a steam pipe passed into a tank of water from which the mixing water is drawn or by a coil of pipe within which a wood fire is maintained.

Elephants Aid Construction of Model Highway

THE new highway from Houston to La Porte, Texas has a number of safety features. On this highway the paved road begins to spread out 50 feet from the bridges, and at the entrance to the bridge, the road and bridge have an added 10 feet to the width of the highway. Other features are the new non-skid black granular surface with white curb and white shell shoulders together with a yellow center streak dividing traffic and making it safe day and night.

The project is 12½ miles long and involved the laying of 660,000 cubic feet of concrete. This necessitated the handling of a large amount of material and when the switching facilities at the plant proved inadequate, the contractor was faced with the possibility of delay. To save the situation, a herd of elephants belonging to a circus and idle at the time, was pressed into service. These huge beasts did everything desired from switching a car of gravel to pushing a heavily loaded truck out of a mud hole. The elephants, the contractor reported, made most intelligent and willing workers, though to see these giant pachyderms toiling in the heat, one might have fancied the scene was in far-off India instead of these mechanistic United States.



GOOD DYNAMITE AND FINE SCENERY, BUT—

This stockpile, about ¼-mile from blasting operations, was close to the top of a hill under one of two trees on this particular crest. As a thunderstorm was approaching we left promptly, and the contractor gave orders to "Get that stuff away from the tree."

How the Other Fellow Did It

Construction Briefs

A Shovelful of Sand Saves Later Regrets

122. You have probably noticed "fat" spots, perhaps 5 or 6 inches in diameter, on bituminous macadam roads and wondered what caused them. A Massachusetts contractor realized the cause of this difficulty and found a very easy way to overcome it. Usually at the end of a run applying hot asphalt on a bituminous macadam job, the distributor is stopped and asphalt is drawn into hand pouring pots from a tap at the rear of the tank. Unless something is placed below this tap, there will always be considerable dripping because of the haste with which the pots are filled and rushed to the edges of the road to touch up spots which have not been completely covered. If a shovelful of building sand is placed on the pavement immediately below the tap or spigot, it will catch the asphalt and prevent its adhering to the pavement, so that when the truck has moved along, the small pool of asphalt is easily shoveled up and thrown to the shoulder.

20.1.85

Skid Helps Wheel-Mounted Compressor Over Soft Ground

123. We recently learned of an ingenious device to prevent a compressor from being mired in swamps while laying a gas line in Louisiana. All of the equipment had to be mounted on skids and hauled by four mules in order to get it over the bog. Even with this arrangement the transportation of a 5½ x 5-inch portable compressor was almost impossible. The compressor was used to test the line, section by section, upon completion and moving was too slow for the job. Delay was caused chiefly by the necessity of removing the skids when dry ground was reached.

The contractor furnished the compressor with a pair of 10-inch channel irons that had previously served as skids, and where they had been turned up at an angle of about 15 degrees at the front, he cut off part of the flanged sides and bent back the web until it was parallel to the main body of the iron. The flat surface was bolted to the front of the compressor frame. When traveling over firm land, the new skids were normally about 4 inches above ground so that they did not interfere with the rotation of the wheels. In soft ground, however, when the compressor sank to a depth of 4 inches, the skids effectually took the load and prevented the machine from sinking further. With this mounting it was possible to make a move in one or two hours that previously had taken a day.

TC 10.37-47

Have You Tried Spreading Your Burlap Along, Instead of Across, the Pavement?

124. A southern contractor whose concrete paving job called for the insertion of a premoulded center strip decided that it was better to spread his burlap over the finished concrete longitudinally instead of transversely. Two men placed the burlap from two bridges, running the strips longitudinally so that the edge of the pavement could be touched up merely by moving one piece of burlap on each side and so that the center joint could be trimmed by one man with a shovel the next day as early as desired without interfering with the curing of the remainder of the slab according to the specifications. The man who cut the center strip used a straight-edged shovel and bore down on the top with his foot, thus removing any little irregularities in the concrete on either side of the strip which had not hardened sufficiently and which would have had to be ground off if left until later.

21.5.66

Culverts Built in Zero Weather to Carry 35-Foot Fill

125. A subcontractor who was handling the construction of culverts on a New Jersey project last year was ready to lay off work when freezing weather started in December. The general contractor, however, urged him to continue the job as he had heavy rock excavation and wished to use it for the 35-foot fill over this particular culvert which had an 8-foot span and was 184 feet in length. This culvert was built in two sections, one-half being completely enclosed until completed and the proper time for curing elapsed. Then the enclosure was moved over to the second half and work continued on that. Heat of at least 50 degrees was kept up inside the enclosure for five days after pouring each set of forms. To meet this condition, the interior of the enclosure was heated day and night with salamanders, using coke for fuel.

The enclosure was framed by 6 x 8-inch sills, 2 x 4-inch x 8-foot studs, 4 x 4-inch plates, 2 x 4-inch ties, 20 feet long, and 2 x 6-inch rafters. The south sides and ends were sheathed from the ground to the plate with 10-inch shiplap. The north side was sheathed only for 2 feet up from the ground. The sheathing was covered with heavy building paper all around. It was covered with tarpaulin so placed that it hung down on the north side so that during the day it could be rolled up to the rafters. This provided both light and accessibility during the working hours. At night, the canvas was dropped and tied down.

Not only was care exercised in heating during the pours, but all aggregates were also heated. Corrugated pipe 15 inches in diameter was placed at the bottom of the sand and stone piles and used like the old fire boxes in burning kilns of brick, to heat the sand and stone. No steam plant was available and heated water was procured by taking water from the stream through a force pump and passing it through a coil of 1-inch pipe fitted into a large salamander and heated by a raging wood fire. This did not work out so well so a large drum was placed high on the hill for steady pressure and as a precaution against pump failure during the operation. With these precautions the contractor was able to continue his work while the outdoor temperature ranged from 4 degrees below zero to 70 degrees above.

21.3.66

Duplicate Batch Hoppers Speed Truck Delivery

126. It was our privilege some time ago to visit a ready-mixed concrete plant which was also equipped to deliver dry batches to trucks for mixing on the road where that operation was more economical. The contractor realized that considerable time was lost by multi-batch trucks waiting while the different batches were weighed out. Under ordinary conditions considerable time is wasted in duplicating the operation of weighing out the two sizes of stone, and in some cases three sizes of stone, and the sand for the dry batch after the truck has arrived at the plant. A truck would be delayed while three or four separate and complete batches were weighed out. The contractor overcame this delay by the installation of a gantry with twelve hopper boxes which were loaded successively by the batcher operator and then dumped quickly as the truck arrived at the plant. This gantry could be run from one end of the plant to the other so that the boxes could be filled by the batching unit at the ready-mixed concrete end of the plant or at the end equipped solely for dry batching.

21.3.63

The Triborough Bridge—

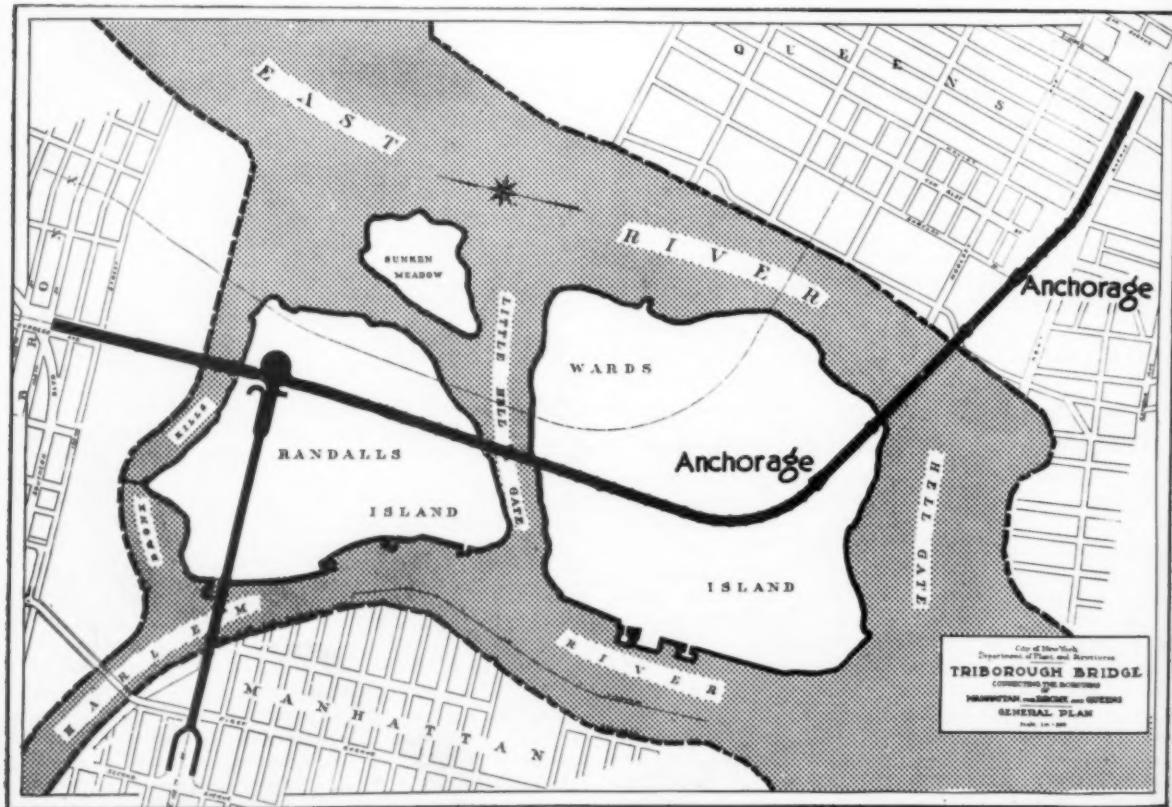
Project Now Under Way Consists of Four Large Bridges

Connecting Three New York City Boroughs

THE Triborough Bridge was first devised in 1916 by Edward A. Byrne, Chief Engineer, Department of Plant and Structures of the City of New York, as the solution to the problem of traffic between the sections of New York City divided by the East River, which hitherto has been carried by four major bridges across that stream. The rapidly increasing traffic during the past few years has necessitated some immediate relief and to meet this need, there is now under construction a river crossing consisting of four large bridges across the navigable waters connected by viaducts on Wards and Randalls Islands, with approaches in the Boroughs of Manhattan, the Bronx and Queens. Of the total length of 17,710 feet, 4,318 feet will consist of bridge structures and the remainder of viaduct and masonry approaches. A suspension bridge over Hell Gate in the East River, with a clear span of 1,380 feet and two approach spans each 670 feet long, is the most important part of the project.

Its clearance will be 135 feet above mean high water, the same as the four other bridges spanning the East River. The crossing over Little Hell Gate, between Wards and Randalls Islands, will be made by two 375-foot steel arches while the Bronx Kills will be crossed by a fixed bridge 268 feet long. The bridge over the Harlem River at 125th Street, Manhattan, will consist of a 320-foot vertical lift span with side approaches. All foundations, towers, anchorages and cables of the suspension span and the viaduct columns are designed to support a second deck without further strengthening, should future traffic necessitate additional facilities.

For the suspension bridge over Hell Gate there is one anchorage located on Wards Island and one in Astoria, Borough of Queens, each of concrete faced with granite masonry. The one on Wards Island will contain 59,000 cubic yards of concrete and the Queens anchorage, 73,000 cubic yards of concrete. Both of these are now under construction.



Material Handling

on the Wards Island

and Queens Anchorages

HANDLING CONCRETE AT WARDS ISLAND

The concreting plant at Wards Island is of particular interest in the method used to handle the mixed concrete. All aggregates and cement reach the island by barges. The anchorage site is some distance from the water front landing. The batching and mixing plant is located at the barge dock which permits the unloading of the barges by crane and clamshell bucket to the Butler bin and the direct discharge of the bulk cement containers into the bulk cement plant. Double handling of sand and gravel from the barge to stockpiles and to the batchers is reduced to a minimum as the barges in themselves serve as storage, though stock bins of sand and gravel are maintained for emergency. The cement containers or flasks are also stored on the barge for use as required and are handled by the barge derrick.

The average individual batch of concrete weighed out at the batching plant consists of 2,542 pounds of gravel, 1,050 pounds of sand, and 564 pounds of cement with 28 gallons of water. This is discharged into the two Rex 1-yard mixers and mixed for one minute. The mixers discharge into a 3-yard steel hopper which has a gated delivery to the belt conveyor running beneath the hopper. Belt loading is regulated by a man stationed at the gate lever. Two belts convey the mixed concrete a total distance of 1,175 feet. At the end of the second belt is a hoisting tower equipped with another 3-yard steel hopper from which the hoisting bucket is loaded. A signal system connects the charging and delivery stations of the conveyor system and a push button panel is also located adjacent to the tower man so that he can at once start or stop the conveyor system.

THE CONVEYOR SYSTEM

The conveyor system consists of two units of 22-inch belt width. The first, or No. 1 conveyor, is 419 feet long and runs from the hopper into which the mixer discharges to a transfer station at an intersection with conveyor No. 2. This second conveyor which is 756 feet long starts from the transfer station at an angle of about 90 degrees to the line of No. 1 unit. The two units thus run along two sides of restricted property that could not be crossed by any desirable single direct line conveyor. Each conveyor unit has its drive at the



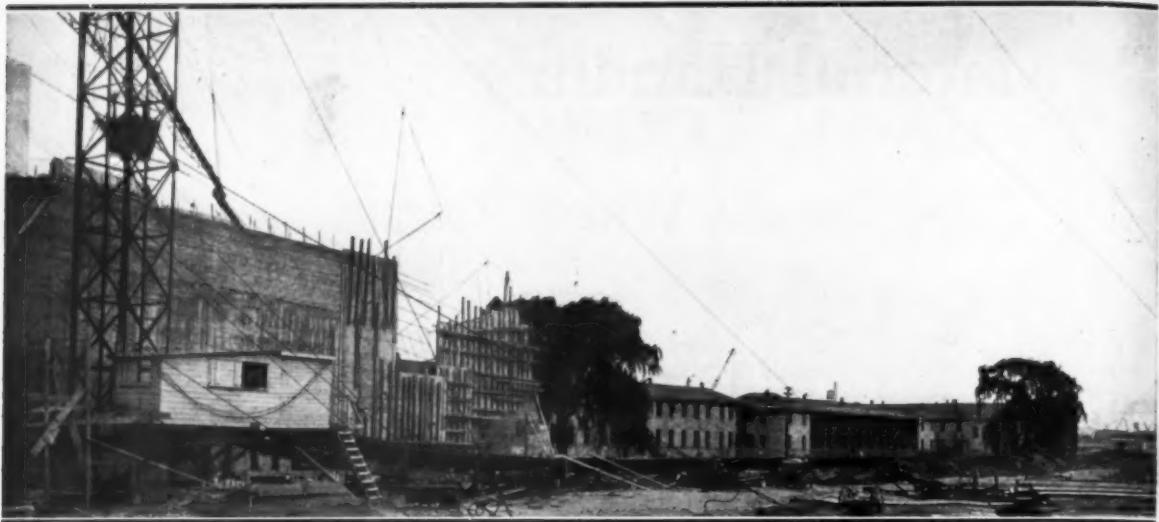
The No. 1 Belt Conveyor Transporting Concrete from the Mixing Plant to Conveyor No. 2 at the Wards Island Anchorage

head end with electric power. A 15-horsepower motor is used for No. 1 unit and a 25-horsepower motor for No. 2. These two conveyors have an interlocking push button control with panels at the tower and at each motor position. The conveyor speeds are about 600 feet per minute so that the time of transport of the concrete from the mixer hopper to the tower hopper is about 2 minutes.

Fixed scalping and automatic pressure squeegees are applied in tandem to the return belt immediately back of the head pulleys, thus effectively cleaning the belt



The Transfer Station Where Conveyors No. 1 and No. 2, Handling Concrete for the Wards Island Anchorage, Meet at a Right Angle



The No. 2 Belt Conveyor Delivering the Concrete to the Hoisting Tower Station at the Wards Island Anchorage

and returning the wipings to the load. The conveying belts operate over three-pulley troughing and single-pulley return idlers. These have well-protected ball bearings with Alemite lubrication.

The belts are of special construction and material to meet concrete handling requirements. The conveyors are supported upon wood construction with the belt elevation about 3 feet above ground level and with wind and weather protection. The head stations are enclosed in weatherproof rooms. One man is used to attend to the lubrication of the shaft bearings and motors, squeegee replacements and patrol of the entire conveyor system.

Concrete pouring was started on July 3, 1931, and has continued steadily with very satisfactory progress. About 80,000 tons had been placed by the end of November, working one 8-hour shift per day. No night work is allowed on Wards Island. The average hourly duty of the conveyor transport system is 160 tons of concrete. This rate is largely fixed by combinations of the dock, mixing station and spouting service conditions. The conveyor system has an ample capacity to handle an hourly average tonnage in excess of the rate actually delivered.

THE QUEENS ANCHORAGE

Eastward of the Wards Island anchorage across Hell Gate and on rising ground back of Astoria Park, the companion anchorage of the Triborough Bridge will contain 73,000 cubic yards of concrete under the present contract. Additional concrete and granite facing will be added in a later contract.

The contractor for the Queens anchorage, the Arthur McMullen Co., New York City, adopted a unique method of installing and supporting the sheathing and bracing for the excavation down to rock. The overlying material consisted of sand and earth for the first 20 feet of depth from Elev. + 38, which was readily excavated by two power shovels. This material was conveyed to the surface by trucks up a ramp, assisted by a hoisting engine as the grade became steeper on the ramp. Below this first 20 feet a dense compacted mixture of sand, gravel and large boulders was en-

countered. This mixture was so densely interlocked that at times it was almost impossible to get the teeth of the power shovel into it and dynamite had to be used to loosen it.

The overburden was excavated to rock at about Elev. —20. The sides of the excavation were confined at the surface to within neat lines and sloped down to an area at the bottom of the excavation equal to about one-quarter of the area at the top, in the shape of an inverted cone. Two pits were excavated in this way, one for the anchor girders and one for the buttress foundation.

The contractor then erected vertical H-shaped 8-inch steel posts to support the horizontal bracing. These posts were spaced about 11 feet on centers and were spliced vertically in about 8-foot lengths, each post containing angle brackets to support the horizontal bracing which was spaced about 8 feet apart. A vertical wooden truss was constructed between the first and second levels of the horizontal bracing at the top, with the compression members meeting in four directions at each post. This gave support to the top of each post in four directions so that when it was necessary to add an additional length of post at the bottom when digging deeper, the two timber truss systems at the top permitted the vertical post to be hung at the top instead of supported at the bottom. This scheme greatly facilitated the speed of excavation to final rock and added a large factor of safety to the bracing system.

On the Astoria or Queens anchorage conveyors are also used for the transport of all concrete material, but their service is of an entirely different character from the Wards Island conveyor system.

MATERIAL HANDLING

On Wards Island all sand, crushed stone and cement are delivered direct from barges to the batching plant at the dock by derricks and the mixed concrete is then transported by conveyors to the distant hoist and spouting towers. On the Queens anchorage, the mixer delivers the concrete direct to the hoist and spouting tower and the batchers are fed by conveyors from adjacent stock and warehouse storage, the supply to

the latter being by truck haulage. The available yard area around the anchorage is not great and the necessary concentration of the various units of this concrete set-up involved careful planning resulting in a very interesting plant.

The plant axis runs north from Hoyt Avenue to the tower on the center line of the southerly front of the anchorage. A truck ramp was built alongside Hoyt Avenue leading over a 10-cubic yard dump hopper into which sand or gravel could be delivered. From under the discharge gate of this hopper, the initial conveyor, a 26-inch belt, 240 feet long, runs on an upward incline of 18 degrees to an elevation of 27 feet. It then runs level and has a tripper operative over the sand and gravel storage below the level section. This belt has a duty of 300 tons per hour at a speed of 350 feet per minute and is run by a 40-horsepower motor.

Below the stockpile or storage, which contains about 4,000 tons, there is a heavily framed tunnel, with draw-off gates in the roof. The second conveyor, a 26-inch belt, 306 feet long, receives its load in this tunnel and runs up on a 15-degree incline leading to the batching plant hoppers. This unit has a capacity of 350 tons per hour of either sand or gravel with a speed of 440 feet per minute. It lifts the material a total of 48 feet and is run by a 40-horsepower motor. A warehouse for bag cement is located to the west of the tunnel portal and is reached by trucks passing under the incline of the second conveyor. From this warehouse cement in bags is sent to an opening platform above the mixers, over a three-unit 20-inch belt conveyor system.

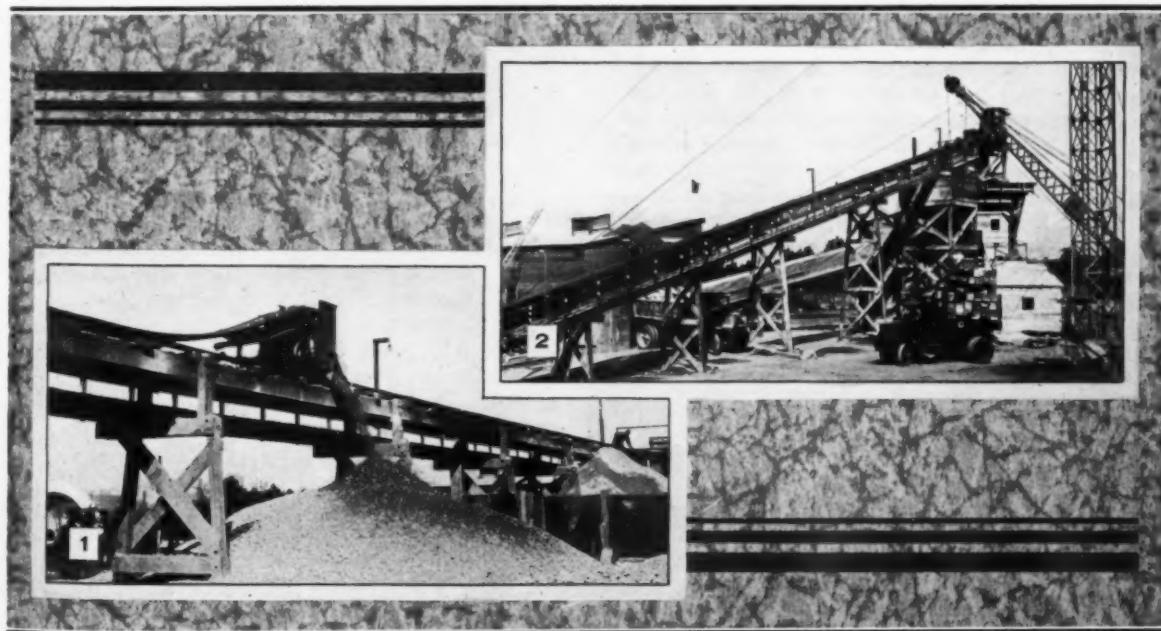
The problem of conveying the bags satisfactorily is one of being able to place the bag on the belt and deliver it to its destination with a minimum of shock. This requires that the first or loading belt be a slow moving one, yet in this case, the requirements called for cement delivery at a rather high speed. The desired re-

sult is accomplished by depositing the cement off the head end of the loading belt into a short chute at right angles which turns the bag and increases its motion onto a faster moving short belt. Another short steep chute from this short belt again accelerates the motion without any harmful jar or breaking of sacks and delivers them at a desirable speed. The first belt is 40 feet long and is operated by a 5-horsepower motor at 50 feet per minute. The second short conveyor is 9½ feet long and is operated by a belt off the tail pulley of the third conveyor, and at a speed of 114 feet per minute. The third conveyor is 90 feet long and is operated by a 7½-horsepower motor at a speed of 270 feet per minute.

The direct answer to supply and demand is found in this plant arrangement. There is no time-supply factor present until the mixers are reached at the terminal. The conveyor transport has a capacity in excess of mixer demand. Two Smith tilting mixers are used, each of 1-yard capacity, with a one-minute mix. In operation the average daily placement has been 1,438 cubic yards for two 8-hour shifts during the period ending November 30. With favorable spouting conditions to the forms below surface level, 1,680 cubic yards or 3,400 tons have been placed in the two shifts.

The conveyors on the Queens anchorage as well as the motors were in service three years ago for a period of six months in the construction of the New York Anchorage of the new George Washington Bridge which was described in the April, 1929, issue of CONTRACTORS & ENGINEERS MONTHLY, pages 232-236. Upon completion of that work, the conveyor equipment, motors and stockpile tunnel structure were dismantled and stored and are here reassembled in a new layout without any particular alterations and with the addition of a tripper only on the initial unit which operates over the stockpile in place of the former derrick service.

(Continued on page 84)



HANDLING AGGREGATES AT THE QUEENS ANCHORAGE

1. The tripper on the initial conveyor delivering sand and gravel to the stockpiles over the tunnel.
2. The conveyor from the tunnel to the batcher hoppers. The sacked cement conveyor is shown in the background.



The Editor Comments —

Highway Construction and the Maintenance of Telephone Lines

Highway construction and telephone communication not infrequently conflict. Several notable instances have come to our attention on projects we have visited and through discussions with contractors. A couple of years ago, in Indiana, a contractor was having a rather difficult scrap with a 1,300-foot muck bed which had an average depth of 5 feet. The muck was excavated to a width of 14 feet from the center line on one side but owing to the presence of a 6-foot underground concrete conduit owned by The American Tel. & Tel. Co., excavation had to be limited to a width of 12 feet from the center line on the other side. This duct contained the wire for two broadcasting networks, a large number of leased wires and, I believe, one of the transcontinental telephone circuits. The contractor was warned that a break in this conduit which might flood it or cause damage to the cable would result in many thousands of dollars a minute penalty to the company which naturally would result in a suit for recovery against the contractor. The telephone company maintained a gang of twelve men on the job and the contractor took special pains in handling fill along the conduit so that no damages resulted.

Another job in the south of a somewhat different character had a humorous slant as far as the contractor was concerned. In this case radio network wires, leased lines and trunk lines were carried in the usual overhead construction. At one point on the road job a ledge had to be blasted out to widen the road, the contractor put in the usual charges and one of the wires was cut by the shattered rock. This was quickly repaired but the contractor was advised to reduce the dynamite charges and blanket all shots. This materially increased the cost of the work over the bid prices, but rather than take the chance of a possible damage suit the contractor pocketed the loss. The day after the contractor moved his equipment off the completed road, a farmer along the right-of-way decided to remove one of his trees. This tree fell across the overhead wires and put every circuit out of commission.

The latest interesting development along these lines comes from the New York Telephone Co. regarding a buried conduit on the north shore of Long Island. As far back as January, 1930, when the highway contractor began driving foundation piles preliminary to the erection of a new bridge, it was found that five submarine cables carrying 5,000 telephone circuits would have to be removed. These were placed 150 feet upstream. As the filling began along the highway, the road rapidly moved upstream, which encroachment meant that the old subways for the cables had to be abandoned for a distance of 3,300 feet and a new subway built on a

higher level corresponding to the fill. Before the new conduit could be filled, the wall of the old subway began to crack and the cable stretched from the pressure of the fill upon the marshland.

A fight against time as well as nature followed. A large trough was laid across the marsh as a temporary subway. Approximately 18,000 feet of new cables had to be drawn through the 3,300-foot trough and a new conductor spliced to take the place of the threatened cables in the subway. Immediately following this came more trouble. The 70,000 tons of earth on the highway fill caused the bottom of the creek on the upstream side to rise 10 feet, upsetting the new arrangement of the cable and making the job of building the new subway even more difficult. By maneuvering the temporary trough to a new position, the work is now progressing satisfactorily and telephone service continues without interruption.

"Hangovers" or Colloquialisms

As one travels around the country the variety of terms used for the different operations on paving work of various kinds is interesting, and makes one think of the days not so very long ago when paving was not the science it is today and when the methods were very crude. Take, for instance, the usual pair of men one sees shoveling the dirt out from behind the subgrade planer pulled by the paver. They are known usually as "final grade men," or to use the term common in Michigan and Wisconsin the "tail graders." One good old-timer who was pouring concrete when it was mixed by hand referred to these men as the "log men," and we asked "why?"

"Well, sir, when we first began laying these concrete roads they weren't so particular about the thickness. Mind you, I don't kick now because there are a lot better roads now than then, but we just smoothed off the old roadbed in those days and put some concrete on top, hoping that it would make a road that would last forever. Some did last and some were gone with the frost, but that was before heavy trucks. My, wouldn't those roads have danced off the grade in jig time if those big trucks had been running then. In those days we did some fancy things ourselves. We rigged a big log behind the first paver we knew and pulled it along to hit off the high spots, just as we used a split log drag on our old dirt roads. We had to have a couple of boys look after the thing and we called them the 'log men,' so when I set some men to work on the steel successor of the old log I always think of them as just 'log men.'"

More along these lines later.

—Theodore Reed Kendall

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December, 1931

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A New Activated Sludge Plant at Rusk, Texas

Designed and Constructed by H. L. Thackwell,

Consulting Engineer, Jacksonville, Texas

RUSK, TEXAS, has recently enlarged its sewage disposal plant, which formerly consisted of simple sedimentation with separate sludge digestion and sludge drying under a glass-over. The new addition includes another sludge digestion unit with another glass-over bed, and secondary treatment by the activated sludge process, including a re-aeration tank, an aeration tank having eight hours retention with a final settling tank having automatic sludge return with excess sludge discharge to lagoons. Both old and new plants were designed and constructed by H. L. THACKWELL.

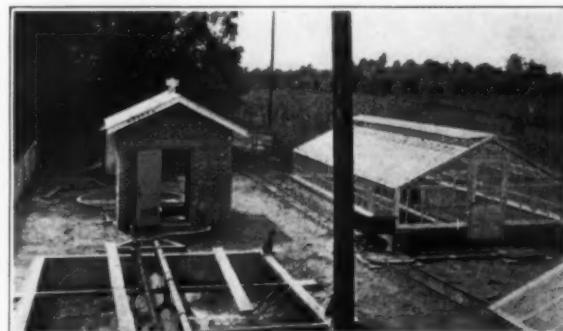


H. L. Thackwell

The interesting feature of this plant is in the design of the aerating tank which is built in the form of double horizontal cylinders. Air is injected through perforated tubes under a pressure of $1\frac{1}{4}$ pounds, these tubes lying parallel to and in the center of the septum dividing the cylinders. The upward rising air and water column is divided by a floating splitter which circulates the sewage by alternate diversions, so that the sewage is actually mixed in the form of a figure eight. Very little intermolecular friction is encountered by this method with consequent economy in the amount of power required for operation. The mechanism for scraping the sides and bottoms of the final tank is run by slow motion reduction from the same motor that drives the rotary compressor. The final effluent is particularly clear and colorless, and the point of dilution with the stream below the plant presents the same appearance as the clear stream above the plant. The perforated tubes in the aerating tank can be removed from the sewage without draining the tank. This is accomplished by a special breech piece which is revolved by a chain

and sprocket drive, which permits the perforated barrel to be tightened into the air conduit or released into a track guide and rolled up a runway to the surface for inspection. The use of perforated pipes is quite satisfactory, provided the openings can be cleaned from time to time by means of a wire brush and lye bath. In this manner grease and soap accumulations and encrustation of carbonates can be removed in a few minutes by the plant operator. An extra set of tubes are kept on hand for immediate replacement, so that it is unnecessary to shut down the aeration for more than ten minutes' time. The original plant is believed to be the first municipal separate sludge digestion plant to be equipped with coils for heating. Also the original glass-over drying bed was the first to be installed in Texas.

The plant is operated by a negro laborer who spends only three hours a day at the plant. The equipment is as nearly automatic as it is practical to make it, and as a consequence the total operating charges for power and labor is only \$75 per month with current costing 3 cents per kwh. The City of Rusk has a population of 2,500, 75 per cent of this number being connected to the sewer. The total cost of the old and new plant combined is \$20,000.



A General View of the Rusk, Texas, Activated Sludge Plant

The Consulting Engineer

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Tentative Specifications for Highway Materials and Methods of Testing

THE American Association of State Highway Officials, National Press Bldg., Washington, D. C., has recently brought out a volume entitled "Tentative Standard Specifications for Highway Materials and Methods of Sampling and Testing." The desirability of having uniform standard methods of testing which could be used by all the testing laboratories affiliated with the Association was recognized in 1919 and this volume is the result of several years of effort in this field.

The Association has likewise been active in the preparation of specifications for materials for highway work. Forty-one have been adopted up to the present time, covering such materials as stone and slag for various types of macadam construction, fine and coarse aggregates for concrete, portland cement, asphalt, tar and numerous miscellaneous materials. These specifications appear in Part I of this publication. Part II contains seventy-four methods of testing, covering practically all of the materials used in highway work, which have been adopted by the Association.

Consulting Briefs

Howard K. Bell, 727 McClelland Bldg., Lexington Ky., reports that he has taken over the management of the Union Water Works Co., owning ten water plants in Kentucky and West Virginia, for operation from his office. He expects to continue his work as an independent practicing engineer in water supply and sewerage and general municipal improvements, as this work will occupy the time of only a portion of the personnel of the Bell organization. H. K. Bell was chief engineer for the above group when first organized and before its sale to another holding company. Under his supervision complete water works for the Grayson Water Co., Grayson, Ky., are being installed and he has just completed a dam in Rolling Fork River for the Lebanon Water Works Co. A contract has just been let for complete water and sewerage systems including iron removal and sewage disposal for Oak Hill, Ohio.



Howard K. Bell

Russell S. Wise, of the firm of Wise and Watson, 199 Washington Place, Passaic, N. J., is now working on plans for the improvement of Alden Street in the Borough of Wallington, N. J., and on the Reis development in Allwood, N. J. These improvements have already been started with Mr. Wise in charge. An article "Modernizing Traffic Rules; Changes Required in Stop Streets and Lights" was prepared by Russell S. Wise, who is chairman of the New Jersey Traffic Commission, and published in *New Jersey Municipalities*, July, 1931.

Engineering Service Corp., Post Dispatch Bldg., Houston, Texas, are making estimates for pipe lines, a railroad and a tonnage survey for The Intracoastal Canal from Brownsville, Texas, to New Orleans, La. Recently they were called as expert witnesses in the case of Koehler vs. I & G N Railway. Under their supervision a cold storage plant and banana storage building is being built in San Antonio, Texas.

C. C. Whitaker, 616 Bona-Allen Bldg., Atlanta, Ga., reports that he is at present working on plans for an addition to the Montag Bros., Inc., factory. One addition to the Montag Bros. plant is now under construction and a cold storage plant for "Magid of Tallulah, Inc.," Tallulah Lodge, Ga., was completed recently.

Chicago Testing Laboratory, Inc., 536 Lake Shore Drive, Chicago, Ill., are at present preparing plans for an asphalt paving research and mixture design for the City of Singapore, and a paving mixture design for Topeka, Kans., as well as several research projects in connection with the development of processes and new products, particularly with regard to the use of bituminous materials and petroleum products. They are also acting as consultants in connection with the development of road building machinery. They were recently called as expert witness in the oil cracking and paving litigation. Under their personal supervision paving work at Dubuque, Iowa, Decatur and Chicago, Ill., is being carried on.

Projects of Colorado Engineer

ACCORDING to a recent announcement from the office of FRED C. CARSTARPHEN, 721 Marion St., Denver, Colo., he recently completed a report on the stresses in drilling lines which includes a defense of wire rope in deep well drilling with cable tools, and deals with the problem of the motion of the walking beam and the swing of the tools. This paper was published in the Colorado School of Mines Magazine in September. He is also working on a report on the change in alignment of the aerial tramway of the Sunnyside Mining & Milling Co. at Eureka, Colo. In order to locate the adit satisfactorily it is necessary to change the location of the loading terminal, so that it is not on the old center line. According to usual methods, this shift could not be made without relocating the entire line, but here the change will be made by arranging angle towers on an arc of 7,000 feet radius in accordance with the technical criteria developed by Mr. Carstarphen. Recently Mr. Carstarphen addressed the freshmen at the Colorado School of Mines at Golden, Colo., on the subject, "Engineering Education in the Business World of Today," and the senior class on the topic, "The Engineer and Correct English."

Consultant Develops Large Sewer Project

AMONG the projects under way in the office of ALEXANDER POTTER, Consulting Engineer, 50 Church St., New York City, is the supplementary joint trunk sewer for eleven municipalities and a sewage disposal plant for the same municipalities. The Joint Meeting which makes possible the joint sewer was originally composed of seven municipalities in Union and Essex Counties, organized about 1900 through the efforts of the governing bodies of the municipalities. Mr. Potter was chosen Chief Engineer, and by his efforts and diligence, the Joint Meeting was brought into being. He assisted not only in the actual engineering reports which were required before the formation of the Joint Meeting, but also appeared before the various municipal governing bodies and assisted in the preparation of the enabling legislation. In 1922, the interested municipalities engaged Mr. Potter to prepare a report on enlarging the sewer built in 1902 and to report upon any plans which might be feasible to give sewer facilities to the interested municipalities. The report disclosed the need for facilities for other municipalities besides those in the original organization. Again Mr. Potter appeared before the various committees and governing bodies and before citizens' meetings to explain the need of the additional facilities. Only the intimate knowledge of the design as well as the requirements of each municipality made it possible to form the joint meeting and Mr. Potter, who was so eminently fitted to step into this role, did so with the result that in 1926 the contracts between the various municipalities were signed and the project is now under way. This Joint Trunk Sewer furnishes sewerage facilities for the City of East Orange, Township of Hillsdale, Town of Irvington, Township of Maplewood, Township of Millburn, City of Newark, Borough of Roselle Park, Village of South Orange, City of Summit, Township of Union, Town of West Orange and also sewage disposal facilities and the main trunk sewer for the City of Elizabeth, New Jersey.

An article describing the work on one section of this sewer appeared in the November issue of *CONTRACTORS AND ENGINEERS MONTHLY*, on page 65.

Other projects being planned by Mr. Potter include two pumping stations for Parsippany-Troy Hills Township, N. J., dock improvements in Elizabeth, superstructures for a 150-mgd sewage disposal plant in Elizabeth and the development of a water supply from the West Orange, N. J., tunnel. Construction going on under Mr. Potter's supervision includes the water distribution system for Parsippany-Troy Hills, the supplementary joint trunk sewer and sewage disposal plant for the eleven municipalities in northern New Jersey and the tunnel through Orange Mountain, West Orange, N. J., the work on which was described in an article in the August issue of *CONTRACTORS AND ENGINEERS MONTHLY*, pages 71 to 74. Mr. Potter has also recently appeared as expert witness in sewer construction cases in Elizabeth and Lavallette, N. J., and as referee in the Denville, N. J., water case.

Diversity of Work of Boston Engineers

AMONG the recent projects of the THOMPSON & LICHTNER Co., Inc., Statler Bldg., Boston, Mass., are the design and construction of a 4-story reinforced concrete structure, approximately 150 x 250 feet, in Cambridge, Mass., for use by the Whitehead Metal Products Co., as a distributing center for Boston and vicinity. The firm is also acting in the capacity of consulting engineers for the New Hampshire Public Service Commission in connection with the review of the design of the Ayer's Island dam extension at Bristol, N. H., as well as conducting research in the design of new products for the Sisalkraft Co., the Rockland & Rockport Lime Co. and the Federal American Cement Tile Co.

The service of Thompson & Lichtner Co., Inc., includes constructive work in the development of balanced sales and production programs and coordination of all phases of operation, market analyses and changes in selling organizations and policies, research studies for manufacturing groups, trade associations and regional or national organization. The T. & L. engineering division designs and reviews designs of structures, supervising construction, inspecting and testing. This organization has a background of experience in a great variety of industries during a period of 25 years, gained by thorough methods and the effective application of knowledge.



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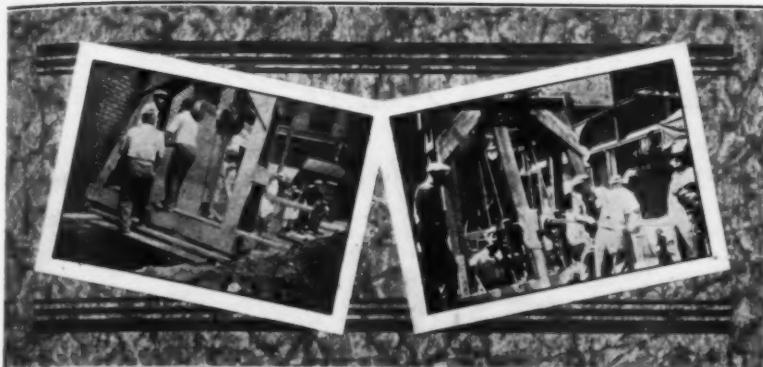
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do not hesitate to call on any
of the Engineers shown here
when in need of advice, or
other information.



Pulling Wood Sheet Piling with a Chain Block and with a Puljack

Philadelphia Company Cut Cost of Pulling Sheet Piling from Trenches

THE Philadelphia Electric Co. for many years has pulled its 2 x 12-inch wood sheet piling out of trenches dug in city streets to lay steam mains, by using cranes, air hoists and chain hoists. Two 5-ton chain hoists were suspended over the trench on a timber frame. This was slow but was found to be cheaper than the more expensive equipment previously used. Six men were needed to operate the two hoists and two men to hook on to the sheet piles, making a total of eight. This crew was able to pull one length of sheet piling 20 feet long in about 12 minutes.

Recently on a job on 12th Street near Arch Street, the same size piling in 20-foot lengths was pulled by a total of five men using two Puljacks, each mounted on one leg of the timber frame and the cable run over a block down to a chain around the piling. One man used the low speed on the Puljack lever to break the stick loose and pulled it about 2 feet. The lever was then shifted to high speed and two men pulled the pile out about 6 inches with every throw of the handle instead of $\frac{1}{2}$ -inch as with each pull on the chain hoist. The timbers were removed in about 5 minutes each.

Bridge Building in Ohio to Aid Unemployed

THE construction of 350 necessary bridges this winter at a cost of \$3,500,000 is Ohio's answer to the unemployment problem, according to O. W. Merrell, Director of Highways. This relief bridge building program will provide work this winter for thousands of Ohio residents and will give the public earlier use of improvements at moderate cost because of present material prices. The bridges are all needed. Of the 6,700 bridges on Ohio highways, 1,600 were found to be too light to bear safely the legal traffic load, according to a recent survey.

Most of the bridges will be of concrete or of concrete and structural steel. Structures on secondary roads which may need to be changed later when modern highways are developed, will be of creosoted timber and steel which may be removed and largely salvaged. Surveys are under way and contracts are now being let. Those engaged on the program are J. R. Burkey, Chief Engineer of Bridges; W. H. Rabe, Chief Designing Engineer; W. G. Smith, Field Bridge Engineer; and C. L. Moyer, Planning Engineer, all under the general supervision of H. P. Chapman, Chief Engineer, and O. W. Merrell, Director of Highways.

Excavating with Electric Motors

AN interesting excavation project in St. Louis, Mo., is being carried on under unusual conditions. The River des Peres, an open stream which for many years had been used to conduct sewage, was condemned as a public nuisance and it was decided to construct a large concrete tube to confine it. A portion of this work was described in CONTRACTORS

AND ENGINEERS MONTHLY for October, 1929, pages 51-57. As there are business buildings and residences along the banks of the present work it was not feasible to excavate the rock and dirt and deposit it along the sides. Therefore two 75-foot towers were erected, 800 feet apart, and between them two cables were suspended, one carrying a bucket for handling from 8 to 10 tons of rock, driven by a 150-horsepower slip-ring motor and the other a 2-cubic yard bucket for carrying mixed concrete, driven by a 75-horsepower slip-ring motor.

The dirt and rock are excavated from 75 to 100 feet ahead of the concrete construction, shovels load the dirt into the rock bucket which carries it back

and deposits it on the finished tube. This plan of handling the excavated material makes it possible to work in restricted space. The inside diameter of the concrete tube is 32 feet and the thickness 2 feet 10 inches. The concrete is mixed at a central plant, where the machinery is electrically driven, and is hauled in trucks to the tower. The concrete conveyor is lowered to a pit and the truck backs up to the pit and dumps the concrete into the bucket, which carries it to the point where it is to be poured.

The water and sewage have to be carried from ahead of one of the towers for a distance of 1,000 feet and emptied into the finished tunnel. This is accomplished by a centrifugal pump driven by a G-E vertical 125-horsepower 220-volt slip-ring motor installed on a steel framework above the pump and direct-connected to a shaft running up through the framework. The water and sewage are conveyed through a 24-inch welded steel pipe in 20-foot sections which are flanged and bolted as they have to be changed as the work progresses. The contract for this job, which involves about \$1,000,000, was let to Stiers Brothers Co., St. Louis, Mo.



The Twin Cableway Consisting of Two 75-Foot Towers Spaced 800 Feet Apart, on the River des Peres Project. One Cable Carries the Excavated Rock and Dirt and the Other a 2-Cubic Yard Bucket for Handling the Concrete.

Legal Points for Contractors

These brief abstracts of court decisions in the contracting field may aid you in avoiding legal difficulties. Local ordinances or state laws may alter the conditions in your community. If in doubt consult your own attorney

Edited by A. L. H. Street, Attorney-at-Law

"If I Die Before I Wake"

Mr. Contractor, if Death should claim you before tomorrow, how would your business be conducted after the funeral?

If you have not given thought to this and talked to your lawyer about it, you had better do it, unless you want your widow or heirs to get into some such mess as a widow did in the case of Kinreich's Estate, 244 N. Y. Supp. 361, decided by the Surrogate's Court for New York County.

It was decided that since a will did not say anything about the continuation of the testator's business, his widow, as executrix, had no right to continue it, excepting to preserve it pending administration. Having no right to continue it, she was liable for any resulting loss to other beneficiaries under the will.

In such a case, the court says that it is the duty of an executor "to insist that the business be sold or liquidated as soon as reasonably possible after testator's death." And the opinion shows that this is true whether the business be controlled by the estate either through testator having owned it individually or through majority stock ownership.

The court also condemned action under which the widow became president of the corporation at an excessive salary, which "furnished a strong motive on the part of the widow to continue the business in disregard of her legal duty."

The will should have given explicit directions for continuation of the business, unless the testator intended that the law take its usual course and dispose of it as soon as reasonably possible after his death.

Rights Where There is Substitution of Material

A novel contention made by a contractor, and what the Washington Supreme Court thought of that contention, are shown by the following extract from the opinion of the court, handed down August 19, 1930, in the case of Headrick v. Martin, Pac. 994:

"The contract covered the brick and tile work on the building, and provided, in effect, that, if more than 280,000 common brick were required to complete the work, respondent [the contractor] should be paid at the rate of \$36 per thousand for the excess of brick so laid. The specifications provided for furring on the inside of a portion of the first story of the outside wall with hollow tile. Respondent was permitted to use hollow brick in the place of hollow tile for this work, and claimed and was allowed \$36 per thousand as an extra for the brick so laid. It appears rather conclusively that tile was specified, and that, if tile had been used, respondent would have been obliged to furnish the tile required at his own expense under the contract. Having been permitted to use brick instead of tile, it seems to follow that he was equally bound to supply the brick under the contract. The amount of hollow brick so substituted for tile, which we find to be 7,500, was not an extra. Therefore there should be deducted from the 24,000 brick, which the trial court found had been used in excess of the 280,000 provided for in the contract, 7,500 brick, which, at \$36 per thousand laid, would reduce the judgment by \$270."

Lien Right Held Not Revived by Belated Repairs

A stroke of a clock often fixes or forfeits a legal right. A right that may be exercised one minute before the end of a business day may be unavailable one minute after the day is done.

So, it is with mechanics' lien rights. The lien laws give ample time in which to file lien statements, but once the time has expired it is generally too late to enforce the security.

But since the time for filing a lien usually dates from the day when the last item of labor or material was furnished, it is very often attempted to make a pulmotor out of an added bit of material or labor, and thereby breathe life into a dead lien right. An illustration appears in the case of Bohunek v. Smith, 172 N. E. 852, decided by the Ohio Court of Appeals in Cleveland. It was declared by the court that repair work done by a contractor on a heating system 14 months after completion of the original job could not be regarded as the last item of work, and thereby permit a lien to be filed for the original contract price within sixty days after that date. In passing, the court said:

"The rule seems to be well established that where a contract to furnish material is to be regarded as completed a subsequent gratuitous furnishing of material, in the nature of a substitution or replacement to remedy a defect in material originally delivered, will not operate to extend the time within which to claim a mechanic's lien."

Controlling Corporations

The nature of the ordinary contracting corporation is such that its affairs might be seriously disrupted through the passing of a block of shares from a member friendly to the company's existing policies to a stranger. To guard against such situations, it has become very common these days in corporate organization to place a reasonable but appropriate restriction upon the sale or transfer of stock.

The restriction usually takes the form of a clause in the company's charter or by-laws, giving the corporation an option for ten, twenty or thirty days to buy shares at an appraised value before the holder is permitted to sell to a third party. Obviously, this enables the controlling officers of the company to prevent an upset of stock control.

Such provisions have been frequently upheld by the courts as being valid. The Delaware Supreme Court has just sustained the validity of a restriction of this kind.

But a California decision, also very lately announced, is to the effect that where a certificate of stock recites on its face that it is transferable on endorsement and surrender, with no intimation of any restriction on transfers, a bona fide purchaser of the certificate is entitled to a transfer of the shares, unaffected by a by-law, unknown to him, providing, "No share of stock in this corporation is transferable without the holder thereof first presenting the same for sale to said corporation".



Digging the 500-Foot Trench for the Fox River Crossing for a High Pressure Gas Main

Ditcher Cut Subaqueous Trench for Gas Line

WHEN the Illinois State Training School for girls increased its demand for natural gas to 4,000 cubic feet of gas per hour, the existing low pressure mains proved inadequate, necessitating connections with a high pressure transmission main on the far side of the Fox River. The new line of 2,200 feet of 3-inch welded steel pipe required a 500-foot river crossing, the trench for which was dug by a Barber-Greene dumper.

A novelty in the handling of pipe for such a crossing with the use of a cable attached to the dumper was the pulling of the pipe into the trench soon after it was dug. It was assumed in making the river crossing that immediately after the ditch was dug some excavated material would be washed back into the trench. Therefore, the pipe to be laid in the river bed was welded on the west bank in a string and fastened to the dumper by a cable. The dumper moved across the river digging the trench as it progressed and the pipe dragged into the ditch immediately behind it. This work was done under the direction of A. G. Ford, General Gas Superintendent, Western United Corp., Aurora, Ill.

The Bureau of Contract Information and the Responsible Contractor

THE following recommendation was adopted by resolution at recent meetings of the various boards of the Bureau of Contract Information, Inc., Washington, D. C. Its purpose is to give every responsible contractor an opportunity to do his part along with surety companies who are definitely cooperating with the Bureau. Every responsible contractor can make the Bureau effective by:

1. Filing with the Bureau of Contract Information his performance record with statement of contracts on hand, providing he has not already filed it.
2. Remembering that he cannot use the Bureau to promote his individual interests against another responsible contractor, regardless of association affiliation.
3. Sending to the Bureau reliable information bearing upon definite irresponsibility of any contractor, and realizing that all information submitted is subject to verification.
4. Reporting the name of any surety company writing bonds for contractors where irresponsibility is definitely known and regardless of whether the company is or is not supporting the Bureau.
5. Definite refusal of responsible contractors to purchase bonds from surety companies writing bonds where irresponsibility is definitely known.

sibility is definitely known.

6. Responsible contractors giving greater consideration of the responsibility of the bond offered them and consideration of companies who are definitely cooperating in the stabilization of their industry.

7. Responsible contractors realizing they will individually benefit from the Bureau in proportion to their activities in the problems of the Bureau.

An Error

IN the five progress pictures shown on page 67 of the November issue of CONTRACTORS AND ENGINEERS MONTHLY an error occurred which we wish to correct as a matter of record. The title read, "The George Washington Bridge from Caisson to Service." As a matter of fact the George Washington Bridge piers were built in cofferdams rather than in caissons, this being the first important cofferdam job executed with deep arch piling sections. The First Progress Report of the Hudson River Bridge issued by The Port of New York Authority, January 1, 1928, states: "The two cofferdams, one around each base, represent by far the largest and deepest open cofferdams ever constructed for bridge work and consequently great care was called for in the preparation of their design and in their construction."

Bulk Cement on Long Island Job

THE Silliman & Godfrey Co., of Bridgeport, Conn., was the contractor for a highway job on Long Island this summer. In order to take advantage of the savings in the use of bulk cement over cement purchased in paper bags, permissible under the 1931 New York State specifications, a Heltzel automatically operated bulk cement handling plant was installed on a railroad siding, as shown in the illustration. According to Fred R. Silliman, President of the company, it was possible for the operator to deliver the cement to the batch in 30 seconds. Several special tests were made to determine if the claimed accuracy and saving could be verified by handling bulk cement through this Heltzel electrically controlled plant. In every case tests were identical and practically no loss was sustained by the contractor, and there was no variation in individual batches. One of the recent tests on three cars of cement showed a variation of only 2 barrels, an average of two-thirds of a barrel variation for each car.



The Set-Up of an Automatically Operated Bulk Cement Plant at a Railroad Siding, Northport, L. I.

The Petroleum Tariff Question from a Contractor's Standpoint

Contractors & Engineers Monthly
470 Fourth Avenue
New York, N. Y.

Letter to the Editor:

The article in your November issue advising against an import tax on oils is certainly far-fetched, and I wish to make these few comments regarding the advisability of a tariff on the importation of crude oils and foreign manufactured gasoline.

It is a certainty that our nation cannot return to prosperity while a large section of the buying public has its purchasing power destroyed. This situation, however, prevails in the second largest industry of the United States, the oil industry. This condition is primarily brought about by the importation of foreign oils, and gasolines manufactured by the cheapest of foreign labor, duty free.

The foreign competition of duty-free oils is so keen that less than ninety days ago the highest quality of crude oil was selling at 5 cents a barrel of 42 gallons, or less than $\frac{1}{6}$ cent a gallon. In Oklahoma and Texas are several oil fields, each of which can produce enough oil to supply the world. Through a superhuman effort, thousands of oil well operators voluntarily reduced their production to a small percentage of the potential capacity of their wells.

In addition to this, the states of Oklahoma and Texas, by the use of their National Guard and martial law, have enforced the practical closing of the world's two greatest oil fields. It does not require any great effort to imagine how many thousands of men, both directly and indirectly, are thrown out of employment.

Oil wells require an investment of as much as \$200,000 each. When the production is stopped or, if allowed to produce, practically nothing is received for the oil, there are no returns on the invested capital. On the contrary, interest, depreciation, taxes, and the necessity of drilling offset wells deplete the credit of the producers and their banks as well.

You can readily see that while the capital of the oil producing states remains "frozen," it cannot be used for the purchase of products manufactured by the same eastern manufacturers who benefit by the oil produced or manufactured by South American or peon Central American labor.

This article in your magazine states that the contractors are benefited by cheaper gasoline. The same may be said of cement or any other commodity. However, it is almost an axiom that when cement, lumber, gasoline or other products that enter construction, are cheap, there is insufficient work available to keep the contractors busy.

The writer, who as a contractor specializing in industrial construction and furnace masonry work, travels extensively throughout the central half of the continent, has many occasions to observe the plight of contractors due primarily to the dumping of duty-free oils and gasolines on the already over-stocked market, also that of the investing public who have their all tied up in non-profitable producing oil wells. Today a producing oil well is a liability and not an asset.

There appears to be a "cancer" somewhere in the side of those in authority at Washington who provide for the highest protective tariff in the history of the country on practically all of the products manufactured in the East, and none on oil. The quicker this "cancer" is exposed to the sunshine, the speedier will be the national recovery.

The over-centralization of wealth or the over-centralization of power creates servitude and chaos.

Yours very truly,

(Signed) GEO. P. REINTJES,

Geo. P. Reintjes Co.

Kansas City, Mo.

Asphalt Production East of California

REFFERRING to an article appearing on page 69 of the November issue of CONTRACTORS AND ENGINEERS MONTHLY, which related to a tariff on imported petroleum oils and products, exception has been taken to the statement that there was no suitable domestic asphalt outside of California. We wish to correct this statement after investigating the sources of supply of asphalt used in the United States as it is a well established fact that there is a large production of domestic asphalt that is giving excellent results.

We feel it was not the intention of the author to question the quality of asphalt that has been produced in the United States for the past ten years and which has proved to be entirely satisfactory in the work in which it was used.

A very interesting report dated December, 1930, covering domestic production of asphalt crude, as well as importations, made by A. H. Redfield, can be secured from the United States Bureau of Mines.

The Triborough Bridge

(Continued from page 71)

PERSONNEL

The Triborough Bridge is being financed by the City of New York by issue of corporate stock of the city, to be redeemed by the revenue resulting from toll charges. All details of design, including the architectural treatment of the various types of structures in the whole project, and the supervision of construction are being executed by the Department of Plant and Structures of the City of New York, under Commissioner Albert Goldman, with Edward A. Byrne, Chief Engineer, in charge. A. C. Codet is Resident Engineer in charge of construction of both anchorages for the Department of Plant and Structures.

The layout for the mixing plant, cement handling and dock yard equipment for the Wards Island anchorage was designed by Albert Bersin, President and Chief Engineer of the Bersin-Romm Engineering Corp., contractor for the project, assisted by Frank Ginsberg of the H. O. Penn Machinery Co., both of New York City. The Bersin-Romm Engineering Corp., is general contractor for the entire anchorage core construction, including excavation of the site and the placement of concrete and steel. Albert Bersin is in general charge.

The Arthur McMullen Co., of New York City, is the general contractor for the Queens anchorage core. Howard B. Gates, Chief Engineer for the company, and Frank P. King, Superintendent, are in charge of the work.

Designs for both conveyor systems together with the manufacture and supply of all conveyor equipment and feed hoppers were furnished by the Conveying Weigher Co., New York City and Passaic, N. J.

The Leipzig Trade Fair

EVIDENCE of Germany's confidence in the future is found in the offer of free trips to the Leipzig, Germany Trade Fair to be held March 6 to 12, 1932. These trips are offered to American business men in all parts of the country. The expenses of the trip from the United States to Leipzig and return will be refunded on the basis of orders placed at the Fair, and the refund will be made in cash at Leipzig during the Fair. The Leipzig Fair maintains nineteen offices and official representatives throughout the United States. From its main office, 10 East 40th St., New York City, detailed information regarding the Fair and the free trips may be obtained.

Construction Industry News

C. H. & E. Mfg. Co., Milwaukee, Wis., and **Insley Mfg. Co.**, Indianapolis, Ind., have been released by the holding company, the National Equipment Corp., Milwaukee, upon vote of the stockholders. Both companies have passed back to their old owners and management. This action was taken after several months consideration of the problems involved and after the matured conclusion on the part of the officers and directors of each company, according to Frank F. Hase, President, C. H. & E. Mfg. Co.

Continental Rubber Works, Erie, Pa., has opened a branch factory in Memphis, Tenn., in charge of O. T. Rauch who has had a number of years of experience in the mechanical rubber goods business in Memphis and vicinity.

Littleford Brothers, Cincinnati, Ohio, has opened a Chicago office with Herbert M. Orschel, formerly with the Mohawk Asphalt Heater Co. and Aeroil Burner Co., in charge. Mr. Orschel has had long experience and a wide knowledge of the road maintenance and contracting field. He will maintain a well-stocked warehouse and will be prepared to give immediate service from 217 E. Illinois St., Chicago, Ill.

Caterpillar Tractor Co., Peoria, Ill., has announced several changes in its personnel. Paul Weeks will assume charge of the Washington, D. C., office under the title of Washington Manager. L. B. Neumiller assumes the duties of Service Manager. L. G. Morgan becomes General Parts Manager. R. H. Gardner supersedes W. H. Goodwin as Assistant Sales Manager and Mr. Goodwin will work directly with Mr. Bell on territorial matters.

Galion Iron Works & Mfg. Co., of Galion, Ohio, has appointed the K. D. Noble Co., 247 Pearl Street, Hartford, Conn., as its distributor for the territory comprising the entire state of Connecticut and western Massachusetts bounded by, but not including, Worcester County.

The Byers Machine Co., Ravenna, Ohio, has announced that the Beckwith Machinery Co., Pittsburgh, Pa., has recently contracted to handle the complete line of Byers shovels and cranes in sizes from $1\frac{1}{2}$ to $3\frac{1}{2}$ cubic yards. The Beckwith territory includes western Pennsylvania, southeastern Ohio and counties in West Virginia within 100 miles of Pittsburgh.

Chain Belt Co., Milwaukee, Wis., has recently appointed the Ohio Valley Machinery Co., Marietta, Ohio, as its distributor in eastern Ohio. This company will handle the entire Chain Belt line of mixers, pavers, pumps, saw rigs, plaster and mortar mixers, central mixing plants, truck mixers and other construction equipment.

Lincoln Electric Co., Cleveland, Ohio, has announced the removal of its New York office from 136 Liberty Street, to 330 West 42nd St. The new offices include a showroom and equipment and facilities for the demonstration of motors, welders, new electrodes and innovations. G. N. Bull continues as New York District Manager. Branch offices have also been established in Scranton and Allentown, Penna., with D. Levenson and F. Shackleton in charge respectively.

Phil Koehring—Leader

ONE of the most interesting anecdotes in the life of the late Philip Koehring, President, National Equipment Corp., as told by B. K. Burns, one of his associates for nineteen years in giving written expression to the ideals and principles of Philip Koehring to the equipment and contracting field, ably portrays the courage and character of the man. Fifty, sixty men, Koehring salesmen from every part of the United States, were sitting at a long table with "Phil" at the table's end. One after another, up one side of the table and down the other, the salesmen stand and talk to "Phil" excitedly.

"If you put this out, you'll kill your company. You can't be associated with a thing like this. Leave it alone!"

It was the batchmeter the salesmen were condemning on the grounds that contractors wanted to put stuff through the drum in the fastest time possible without regard for quality. Never was "Phil's" direct earnestness so electric as in his reply.

"Boys," he said, "it's you who are afraid—not the contractors. It isn't in most men to want to do shoddy work. If concrete construction is to go ahead, there must be means of measuring and standardizing the quality of concrete. This company will make the batchmeter, will advertise it and will sell it to other mixer manufacturers for the good of the industry."

The history of the universal use of the batchmeter tells the rest of the story.

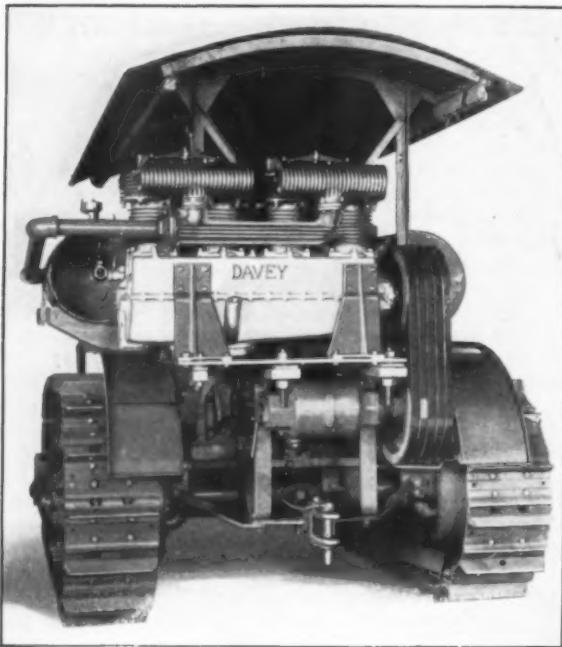


The Late Philip Koehring

Distributors' Bulletin Board

The distributors of construction equipment listed below have made changes this month in their cards appearing in the Distributors' Directory on pages 105 to 131 of this issue of CONTRACTORS AND ENGINEERS MONTHLY:

Boehck Machinery Co., Inc., Milwaukee, Wis.
 Brown, Fraser & Co., Ltd., Vancouver, B. C.
 Canadian Equipt. Co., Montreal, Canada
 Construction Equipt. Co., Spokane, Wash.
 D. C. Elphinstone, Inc., Baltimore, Md.
 Engineers & Contractors Supply Co., Milwaukee, Wis.
 Gibbes Machinery Co., Columbia, S. C.
 Hedge & Mattheis Co., Boston, Mass.
 Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.
 Kern-Limerick, Inc., Little Rock, Ark.
 W. B. Louer Co., Chicago, Ill.
 Joe Lyons Machinery Co., Little Rock, Ark.
 McCracken-Ripley Co., Portland, Ore.
 H. W. Moore Equipt. Co., Denver, Colo.
 Mussels, Ltd., Montreal, Canada
 The K. B. Noble Co., Hartford, Conn.
 C. V. Pierce Co., Inc., Pleasantville, N. Y.
 T. L. Pitts & Son, Charlotte, N. C.
 C. F. Rabbeitt, Inc., St. Louis, Mo.
 S. & L. Equipt. Co., Fort Wayne, Ind.
 Sid Schultze, Louisville, Ky.
 Southern Machinery & Supply Co., Roanoke, Va.
 Truck & Tractor Equipt. Co., Ltd., Toronto, Canada
 The W. T. Walsh Equipt. Co., Cleveland, O.
 Western Material Co., Sioux Falls, S. D.



The Davey 310-Cubic Foot Air-Cooled Air Compressor

A 310-Cubic Foot Tractor-Mounted Compressor

A 310-CUBIC foot four-cylinder air-cooled air compressor made by the Davey Compressor Co., Inc., Kent, Ohio, is now available for mounting on a Caterpillar Sixty tractor. Through the use of this combination, tractor owners can now have on their work all the advantages of a portable air compressor of large capacity but without the extra investment, inconvenience and operating expense of a separate heavy trailer-mounted unit. The mounting consists of steel extensions which bolt to the tractor frame out of the way at the rear of the tractor. This mounting and location do not interfere with normal tractor drawbar operation. The compressor unit and mounting weigh only 1,800 pounds complete and do not interfere with the tractor balance or the pressure on the treads.

The compressor drive is by the tractor engine through five V-belts and the standard Caterpillar stationary drive which embodies the clutch. The cushioning effect of this drive absorbs the pulsating compressor torque and eliminates any possibility of undue wear or strain on the tractor mechanism. This driving arrangement also permits the compressor to be started or stopped instantly, whenever desired by a slight movement of the conveniently located clutch lever.

A Full-Revolving $\frac{1}{2}$ -Yard Excavator

THE Wright excavator, manufactured by the Pontiac Tractor Co., Pontiac, Mich., is a fully convertible, full-revolving $\frac{1}{2}$ -yard shovel, completely equipped with two drums and boom hoist, to handle any kind of shovel or crane work. Sturdy heat-treated alloy steel castings are used throughout. The simple method of construction eliminates all unnecessary parts, and includes the use of roller bearings on all bearings of over 20 rpm, full force feed lubrication to all other slow speed, heavy-duty bearings and a large factor of safety throughout.

The hoist is made by removing the entire rear axle and differential of the McCormick-Deering Model 20 industrial tractor and substituting a chrome-nickel shaft mounted on four brackets with Hyatt roller bearings. This gives a hoist driven through an enclosed transmission with hardened gears running in a bath of oil which are designed to take the full power of the motor at any speed. Drums are large and mounted on Hyatt roller bearings. The cross shaft is of chrome-nickel steel driven by roller chains from each end of the drum shaft. Bearings are constantly oiled from a force feed lubricator.

The swinging gears are two 18-inch 45-degree bevel gears mounted on a cross shaft between the bearings. Each is actuated by self-energized cone clutches, one rotating the shovel in one direction and the other in the opposite direction. In this way each gear is laying against the driving side at all times, and there is no backlash to take up when reversing the swing. The turntable rolls are extra large and are carried in four adjustable housings. These rolls are constantly lubricated by a force feed high pressure oiler. The drums are equipped with large twin disc, Raybestos lined clutches and swinger gears are driven through Raybestos lined cone clutches. All clutches are self-energizing and will transmit the entire power of the motor with very little pressure on the controlling lever.

Traction is through two steel gears carried on the cross shaft. These slide into mesh with gears carried on a stub shaft between the main frame and the crawlers. The final drive is through a roller chain to the crawler sprocket. The crawlers are extra heavy. All holes are drilled instead of cored and are equipped with hardened pins. Rolls are carried on the track pins to minimize the wear on the sprockets. The crawler rolls are spaced close and are made with an oil reservoir.

The boom is made of 8-inch welded box section channels. The trench hoe and the clamshell and dragline boom can be attached to this boom without removing it from the machine, and the change can be made in the field with a minimum amount of time and labor.

The overall width of the machine is 8 feet 6 inches, the length 10 feet and the height 10 feet 2 inches. The shovel boom is 16 feet long, and the crane boom 30, 35 and 40 feet in length. It has four speeds, $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$ and 2 miles per hour.



AT WORK ON HOOVER DAM

Millions of yards of material are being removed during the process of construction of the Hoover Dam. At present, work is being concentrated on the building of the four great diversion tunnels, each 50 feet in diameter and having a combined length of over 3 miles through solid rock, involving the hauling of nearly 1,000,000 truck loads. Six Companies Inc., contractor for the project, recently purchased a fleet of fifty International Harvester trucks, two of which are shown above being loaded by a Marion shovel.



The Seminole Boom Mounted on a McCormick-Deering Tractor

An Improved Pipe-Handling Boom

THE value of a tractor machine for pipe line work can only be measured by its performance, durability and stability. The Resistcor Engineering Corp., Muskogee, Okla., has developed the Seminole pipe-handling boom which has a number of exclusive features, including only two levers which are used to control the operation of the boom member. These levers are conveniently located for the operator's use with either hand. One lever controls raising and lowering the boom and the other controls raising and lowering the lifting blocks. This boom is furnished for Models GH and GM Trackson-equipped McCormick-Deering 10-20 and 15-30 tractors. Other exclusive features are the dual power take-off for the tractor, the self-locking worm and gear drive on the hoist and the Resistcor ball-bearing blocks under the boom.

The boom is especially designed to conform to the construction features of the tractor to which it is adapted. The hoist and boom frame is mounted entirely on the track frames and axle. The entire weight is so distributed as to be carried by only such members as are proportioned to take all load stresses.

An Electrically-Operated Hoist for Cable Drag Scraper Service

THE Beaumont Electro-Auto hoist, a new winding machine especially designed for cable drag scraper service, has been developed by the R. H. Beaumont Co., Philadelphia, Penna. It is essentially a double-drum, two-speed hoist, the high speed for the outhaul being secured by using a larger drum. The motor is the reversible slip-ring type, connected to the hoist by means of a gear drive or silent chain, depending on the size of the hoist. Power is applied to the drums through one-way band-type clutches. When the motor is reversed, one clutch automatically engages and the other disengages, the two clutches being interconnected so that they must act together at all times. The rotation of the motor in one direction connects one drum only, the other drum being automatically declutched. The free drum in either case is under the control of the automatically applied brake which is similar in design to the clutches. There is a separate brake for each drum, their purpose being to prevent the unwinding drum from running faster than the cable is being paid out. These brakes are so arranged that when one is on the other is off.

Due to the fact that this winding machine has automatic clutches and brakes which are automatically applied by a change of rotation of the shaft, the operator is free of all the burden of manually applying clutches and brakes and can be stationed anywhere that the controller wires can be led. All he has to operate is a small master drum switch and he can therefore be located at a point which will give him a full view of the scraper at all times, regardless of the location of the hoist. Another feature in the application of remote control to this Beaumont winding machine is that the operator can keep the equipment going at top speed all day without fatigue.

The use of the reversing slip-ring motor permits the scraper to start digging at a very low speed which gradually accelerates up to about 200 feet per minute until the scraper has secured its load, when it automatically accelerates to 300 feet per minute when the digging operation is completed and the scraper is floating on its load. The empty scraper is returned at 600 feet per minute.

This Beaumont Electro-Auto hoist is made in a variety of sizes and capacities, sizes SGS 1-2-3, with parallel drums, ranging from 1/3 to 1-yard scraper size and from 33 to 100 yards per hour on a 100-foot haul. Sizes SGS 6-7-8, with tandem drums, ranging from 1 to 4-yard scraper size, have capacities in yards per hour of from 100 to 400 on a 100-foot haul.

Rock Crushers for All Sizes of Materials

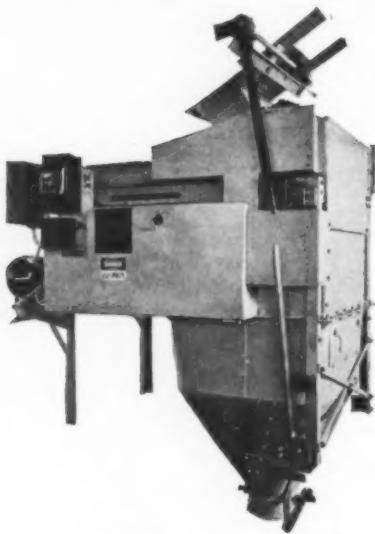
ROCK crushers built in three standard sizes to crush all grades of rock from hard granite, trap rock or gravel to soft sandstone, are made by the New Holland Machine Co., New Holland, Penna.

The New Holland rock crusher on a two-wheel truck makes an inexpensive mounting easily moved by a tractor, while for long hauls the four-wheel truck with tractor pole is more convenient. A shaker chute, making two grades, can be attached to either mounting when not using an elevator. These crushers are made in three sizes with jaw openings of 6 x 9, 7 x 12 or 8 x 16 inches. The smallest of these weighs 2,665 pounds on wood sills and has a capacity of 2 to 4 tons per hour. The 7 x 12 size weighs 3,850 pounds and has a capacity of 4 to 6 tons per hour and the largest size weighs 7,600 pounds and has a capacity of 6 to 10 tons per hour.

This company also makes roll crushers for use as secondary crushers for producing finer aggregate than is profitable to make with jaw crushers. They are suitable for making road chips, pebble dash, sand, fine cinder for block, concrete aggregate and top dressing for water-bound macadam.



The New Holland Rock Crusher with Folding Elevator on a 4-Wheel Truck



The Richardson Duo-Screw Feed Automatic Scale

An Automatic Scale for Weighing Bulk Cement

THE Richardson Duo-Screw Feed scale, manufactured by the Richardson Scale Co., Clifton, N. J., is designed to weigh loose or bulk cement automatically and accurately direct from a properly designed and constructed storage bin, from which all cement for weighing will flow freely without arching or bridging. The automatically-weighed cement is discharged manually, direct from the weighing hopper into trucks as they arrive in the proper position.

The structural steel framework of the scale supports the duo-screw feeding system with complete individual motor drives, the automatic scale weighing levers, the beam box, the weighing hopper and the lower shroud. The scale mechanism is a tubular lever system of low multiplication. The middle knives are of high grade hardened pivot steel, resting in steelings which are set in carrying brackets mounted on the scale framework. End pivots or knives are fixed at either end of the weighing levers. The outer end pivots support the sheet iron weighing hopper in which the cement is weighed.

The scale has a unit capacity of 400 pounds and up to 1,000 pounds based on cement at 77 pounds or more per cubic foot. It may be adjusted to weigh consecutive charges of any amount within that specified range and may be quickly set to weigh standard batches. The scale is equipped with a full capacity weigh beam, graduated from 0 to 1,000 pounds in 50-pound graduations. A sliding, quick-setting counterpoise weight is mounted on the weigh beam. A subsidiary beam with a sliding counterpoise weight, which operates in conjunction with the main beam, is also furnished. Both counterpoise weights are locked to prevent sliding and the weighing beams and poise weights are completely housed.

The main inlet opening of the scale feed hopper is square, measuring 18 x 18 inches inside, and has an angle iron flange all around the opening to suit a similar flanged bin outlet. This large area opening insures a continuous flow of cement from the storage bin when sufficient cement is available.

The feed hopper guides the cement as it flows by gravity from the storage bin into the duo-screw feeding conveyors which are located in the troughed bottom of the feed hoppers, arranged side by side. The system consists of a half-pitch 9-inch flight screw conveyor and a standard pitch 6-inch flight screw conveyor which are confined in individual dust and material tight sheet iron tubes. Motors of ample power

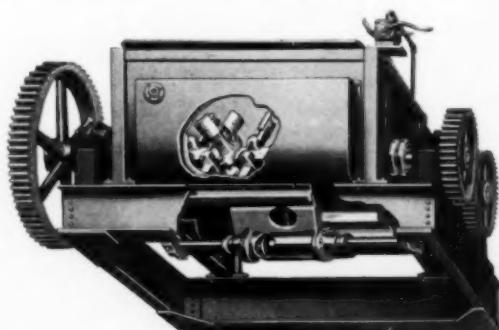
drive the flight conveyors. The feeding system is controlled by heavy-duty mercury switches operated by the main weighing beam. When the weighing hopper is empty and the poise weights are placed in position, the weighing beam descends to the out-of-balance stop, whereupon two mercury switches are tilted to complete the circuit to the driving motors. The attendant operates the push button switch which is wired through the power feed lines to the mercury connectors and completes the circuit. Power thus transmitted starts the motors and the feeding conveyors. The dribble stream or final "make weight" is fed by a 6-inch screw feeder, until the weighing is completed and the beam swings to the balance position, whereupon the second mercury switch is tilted, instantaneously cutting off the stream of cement. At the completion of each weighing and as the final cut-off takes place, the push button circuit is cut out automatically, shutting off all power. Also, as the weighing is retained in the hopper, the beam remains in the balance position and the mercury in the switches is separated. Thus, even though the push button control is thrown in, no more cement can be delivered until the hopper has been emptied.

The discharge opening of the scale weighing hopper measures 9 x 30 inches and it is closed by a single large swinging type door hinged at one side. The door is held securely when closed by means of a toggle lock system. The weighed cement is discharged from the weighing hopper by means of a solenoid through push-button control, the solenoid breaking the toggle lock. The door is kept open by the weight and pressure of the cement passing from the weigh hopper to the waiting truck and as soon as all of the cement has escaped, the door, being counterweighted, closes and locks. The scale is then in a position to receive another weighing of cement and repeat the cycle of receiving, filling and discharging. The scale is equipped with a six-figure, continuous, dust and rustproof, reciprocating counter which records and totalizes all weighings.

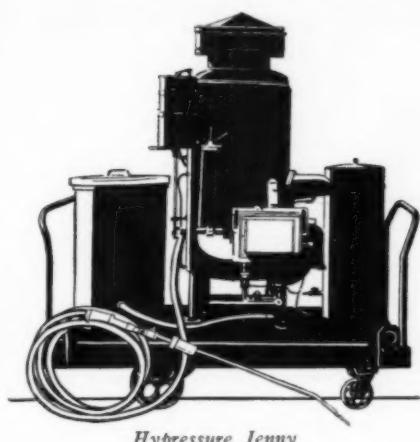
A 2-Ton Asphalt Mixer

A NEW 4,000-pound asphalt plant mixer which is unusual in design, in that the steam-operated discharge gate is radically different, has been placed on the market by Hetherington & Berner, Inc., Indianapolis, Ind. The steam cylinder and discharge gate are one unit. The piston rod is stationary so that when opening or closing the discharge gate, the gate cylinder moves back and forth on the stationary piston rod. A four-way steam valve controls the gate movement. This valve is mounted within the easy reach of the mixer operator. The gate cylinder is located directly under the mixer shell. Thus the cylinders do not overhang the mixer housing.

These mixers are furnished with removable manganese liners inside the shell and also at each end of the housing to take the wear and give longer service. The mixer blades can be furnished either as semi-steel with removable tips or with cast steel shanks and adjustable manganese tips. The gears are rugged and the shaft is made of nickel steel.



The Hetherington & Berner Discharge Gate



Hyppressure Jenny

A Vapor Spray Cleaning Device

A DEVICE which makes it possible to clean hoisting engines in $2\frac{1}{2}$ hours instead of the 16 hours formerly required and to clean economically limestone block which were formerly cleaned with steam from a portable hoisting engine at a rental of \$50.00 per day plus the cost of a licensed engineer, is made by the Homestead Valve Manufacturing Co., Coraopolis, Pa., and is known as Hyppressure Jenny. This device with its oil injection attachment will clean painted surfaces and construction equipment, removing all grease and dirt in a remarkable short time and at little cost.

Hyppressure Jenny comprises mainly 5 elements, a gravity-feed kerosene pilot burner, a pressure-feed kerosene main burner, automatic water or solution and fuel pumps, a heating coil or generator and an outlet or hose connection for transmitting the vapor spray. The pilot burner, similar to a common blow torch, burns continuously while the machine is in operation and serves to heat the vaporizer and ignite the main burner which alternately starts and stops.

A $\frac{1}{4}$ -horsepower motor operates the water and fuel pumps through a double reduction gearing. A special toggle linkage and an actuating spring allow the pumps to start and stop while the motor runs continuously. The pumps work simultaneously and are so proportioned that the temperature of the fluid in the generating coils produces a saturation of the vapor at the nozzle which is uniform and of great cleaning effect.

When the pressure reaches the maximum for which it is manually set, the pressure under the fluid pump plunger overcomes the actuating spring pressure and the two pumps and the main burner stop. If the pressure drops a few pounds the spring again picks up the load and the pumps and main burner function until maximum pressure is restored.

This machine is the outgrowth of an idea to produce a cleaning machine which would combine, in correct proportion, heat, cleaning compound and pressure. It is a complete, self-contained, high-pressure hot water heater, and is so classified by the A.S.M.E. The absence of evaporation in the generating coils permits the introduction of various cleaning compounds such as soap, caustic solutions, various commercial cleaners, ammonia, oxalic acid, or any other compound soluble in water and not injurious to the machine. These are introduced into the feed water without causing deposits on, or clogging of the coils. Full pressure of the machine ranges up to 150 pounds per square inch and can be generated in from 6 to 10 minutes.

A New Heavy-Duty Grader

THE new Wehr grader, recently announced by the Wehr Co., Cudahy, Wis., is massive in construction and is particularly designed for those requiring a large high-speed machine, capable of producing finished work on all types of roads. The Model Z-6 is solidly constructed throughout. The deep 10-inch side members are rigidly trussed by three 6-inch tubular and four heavy flat cross-members.

This grader is equipped with dual 50 x 10-inch rear and 34 x 5-inch front solid rubber-tired wheels, a steel top, a 12-foot mouldboard and blade and side crank, and is mounted on a Model L. I. Case power plant. An independent type scarifier with a screw type lifting mechanism has a cast steel box $56\frac{1}{2}$ inches wide and eleven chrome vanadium teeth or a 13-staggered-tooth scarifier is optional. The cab is 6 feet 1 inch in length and 4 feet 7 inches wide, supported by four $3 \times 3 \times \frac{1}{4}$ -inch angle irons with twelve heavy gusset plates and deep side rails.

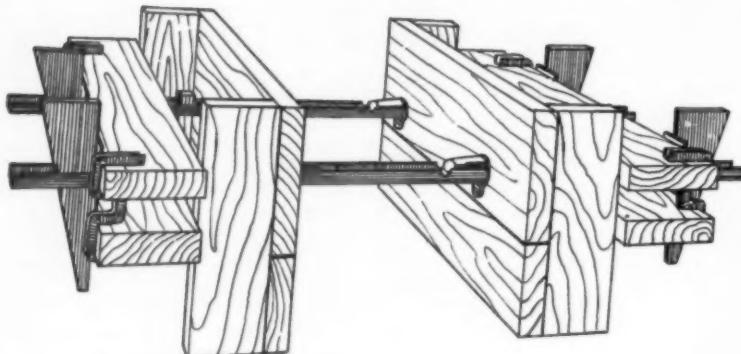
A New Shovel-Crane-Dragline

A NEW all-purpose unit known as the K-48 and serving as a shovel, crane, trench hoe or dragline, has recently been announced by the Link-Belt Co., 300 W. Pershing Road, Chicago, Ill. This model is arranged for gasoline engine, diesel engine or electric motor drive and is equipped with any or all of the attachments which are usually available on smaller machines. Its design includes large slow-wearing crawler rollers, self-cleaning crawler treads, a large ring gear and roller path, large drums, clutches and brakes and unit cast steel construction throughout.

As a shovel the K-48 is standardly equipped with a 25-foot boom, a 17-foot 6-inch dipper stick and a $1\frac{3}{4}$ -cubic yard dipper. As a crane it has a rated capacity of 32 tons at a 12-foot radius and 10,400 pounds at a 45-foot radius on a 45-foot boom. As a dragline, it will handle a $1\frac{3}{4}$ -cubic yard heavy or a 2-cubic yard light-medium bucket on a 45-foot boom, and a $1\frac{1}{2}$ -cubic yard heavy or a $1\frac{3}{4}$ -cubic yard light-medium bucket on a 50-foot boom. As a trench hoe the character of the work and the digging depth determine the size of bucket used. For normal digging depth in average soils, a 2-cubic yard solid-bottom bucket is standard.



The New Link-Belt K-48 Shovel-Crane-Dragline



A Section of Wall Forms Set Up with Speedee Spreaderclamps

A New Wall Tie and Spreader

A WALL clamp in which the spreader feature is a part of the clamp and which can be placed entirely from outside the forms has been announced by R. B. Everett & Co., Houston, Texas. The Speedee Spreaderclamp consists of slotted channels of various lengths placed against which the triangular wedges are driven to form the clamp and an L-shaped unit, forming the spreader. These Spreaderclamps are made for any wall width and may be had in fractional sizes making them adaptable for slanted walls.

The standard clamps are made based on using 1-inch sheeting, 2 x 4 studs and waling. The clamps are made to fit any combination of lumber up to and including 2 x 6 studs and waling. They are scored so that in wrecking it is necessary only to remove the wedge, washer and wales and break off the extending end of the clamps with the hand. The clamps are so constructed as to break off at the back of the sheeting in all cases.

They are also made to break back $\frac{3}{8}$, $\frac{1}{4}$, 1 and $1\frac{1}{4}$ inches inside the finished face of the wall or flush with the surface. Where the break is flush or $\frac{3}{8}$ -inch back, corks are furnished with the clamps at no extra charge. These are used to fill up the hole above the clamp and prevent any leakage and leave a smooth wall. When the break is $\frac{3}{8}$, 1 or $1\frac{1}{4}$ inches back of the wall line, castings are used which are placed above the clamp and form a recess to break the end off inside after pouring. Usually two pieces of 2 x 4 or 2 x 6 are placed with blocks in between to form a split waling. This allows more latitude in placing the clamps than can be secured with bored walings.

Speedee Spreaderclamps are suitable for use on any upright form work for concrete, such as buildings, bridges, highway culverts, retaining walls, concrete tanks, concrete reservoirs and similar construction.

A Slide Rule for Calculating Truck Loads

A CELLULOID slide rule which tells accurately the number of gross pounds, which includes truck and load, that the Reo Gold Crown engine is capable of pulling under varying conditions, noting tire sizes and rear axle ratios required, is being distributed by the Reo Motor Car Co., Lansing, Mich.

To illustrate the service which a truck operator can get from this calculator, Reo offers this example: Take the Reo Model GD 3-ton truck with a dump body, 32-inch tires and a double-reduction 11.78 to 1, rear axle ratio. The gross weight of the chassis and body amounts to 7,150 pounds, while the load, taking into consideration 50 per cent over-

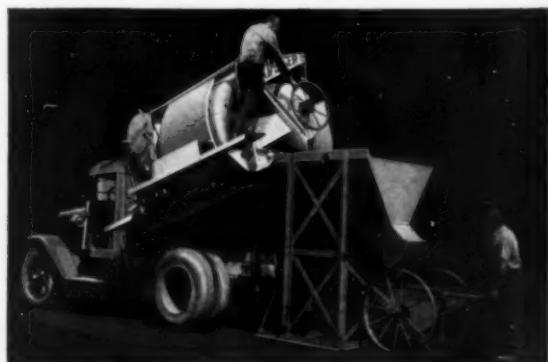
load, would weigh 9,000 pounds, a total of 16,150 pounds. To illustrate the pulling power of the engine and its rapid increase in pulling power as the lower gear speeds are used, assume that it is necessary to pull several 10 per cent grades under good road conditions. Knowing the final gear ratio and tire size, the slide part of the rule is so placed as to register with the axle ratio and tire diameter. Transmission shifts are noted as 1st, 2nd, 3rd and 4th or high. With an axle ratio of 11.78 to 1 and a tire diameter of 32 inches, the figures within the slot under high gear show that the Reo engine is capable of pulling 9,342 pounds gross up a 10 per cent grade, but by moving the slide panel to third gear, the pulling power is increased to 17,190, sufficient for the load to be carried. In first gear, however, the engine is capable of pulling a load of 61,704 pounds up a 10 per cent grade. On level ground the engine is capable of pulling 575,818 pounds in first gear under favorable road conditions. All of these figures have been computed for first class concrete highways. Suitable deductions for rough roads and low grade types should be made.

Readers of CONTRACTORS AND ENGINEERS MONTHLY may secure one of these slide rules by writing to the Reo Motor Car Co.

A Rear-Lift Hoist for Truck Mixers

THERE are many jobs where extra discharge height is desirable for truck mixers. The Jaeger Machine Co., 701 Dublin Ave., Columbus, Ohio, has developed a rear lift hoist attachment which permits sputting concrete over 75 per cent more area and eliminates the use of ramps on many jobs and makes it possible to discharge direct into hoppers for wheeling to points that cannot be reached by truck.

The single hoist has a double support which eliminates body sway, making possible an 8-foot total elevation of the discharge end of the mixer. At maximum tilt the spiral mixing blades of the Jaeger truck mixer discharge $2\frac{1}{2}$ yards of 1-inch slump concrete in 3 minutes. The hoist mechanism is manufactured by Gar Wood at Detroit, Mich. The attachment can readily be mounted on any standard type of truck, which is equipped with a power take-off to drive the hoisting mechanism. The hoist frame alone adds 15 inches to the usual discharge height with the body down while with the body tilted to the maximum it increases its height a total of 45 inches.



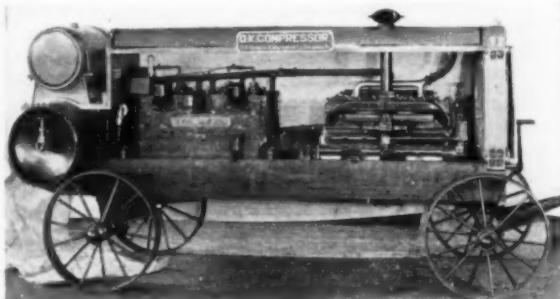
The New Jaeger Truck Mixer Equipped with the Rear-Lift Hoist

A 4-Cylinder 240-Foot Compressor

FEATURING complete interchangeability of parts, the O.K. Clutch & Machinery Co., Columbia, Pa., has announced a 240-cubic foot, 4-cylinder compressor completely interchangeable with the 120-foot, 2-cylinder compressor with the exception of the crankshaft and cylinder block. The portable compressor is driven by a Hercules 6-cylinder direct-connected engine.

The 4-cylinder machine has three bearings, counterbalanced crankshaft and force feed lubrication. The counterbalance weights are cast with the shaft so that there is no chance of their being thrown off in operating.

The water jacket on the cylinder is unusually large and extends to the bottom. In order to insure a cool compressor, the water is pumped into the compressor first, and from there to the engine and then to the radiator. The compressor is equipped with a Penn unloader and the engine is equipped with a carburetor, air throttling device which idles the engine while the compressor is being unloaded and speeds up the engine before the compressor can be loaded up again.

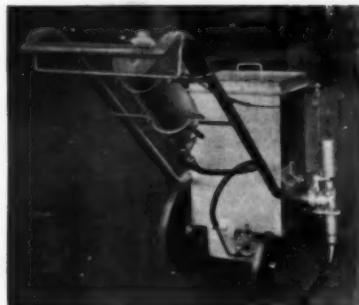


The New O.K. 240-Cubic Foot 4-Cylinder Portable Air Compressor

A Hot Asphalt Pouring Machine for Joints

AHOT asphalt pouring machine designed especially to pour hot asphalt in pavement joints such as brick, blocks of all types and expansion joints in concrete has been developed by the Dobbie Foundry & Machine Co., Niagara Falls, N. Y., and is known as the SavPav hot asphalt pouring machine. This machine places the asphalt where it belongs and not all over the surface, thus retaining the non-skid qualities of the original pavement. Hot asphalt is placed in the swinging inner tank of the SavPav, the asphalt being kept in a hot liquid state by an oil burner. From the inner tank, the hot liquid is carried through the body of the outer tank by a pipe to the control valve. The material flows through this valve, down through one or two nozzles attached to the bottom of the valve, the nozzle being so designed that the hot liquid is discharged in a ribbon shape, thus running directly into one or two joints in the pavement without flowing over the top surface.

Directly in front of the discharge nozzle is a small steel guide wheel which is held in the joint in the pavement by a guide wheel weight. This weight is located on the top of the slide bar and attached directly to the axle of the guide wheel and moves freely in a machined way cast on the control valve. No matter at what elevation the valve and the hot asphalt nozzle may be from the surface of the pavement, the guide wheel is pressed down into the crack or joint and in this manner follows the contour of the joint or crack, swinging the inner tank freely either to the right or left.



The SavPav Crack and Joint Filling Machine

At all times the man operating the SavPav has control of the flow by a valve trigger located on the handle and this means the flow may be increased or cut-off instantaneously. In addition to the control of asphalt, the man at the handle bar has control of the elevation at which he desires the nozzle above the pavement by simply lowering or lifting the handle bar. In the handle bar is located the oil supply tank arranged with a pressure oil pump. From the tank is a line leading to the oil burner with a control valve and strainer. The burner may be removed and the flame directed against the hot asphalt valve when starting. After the valve has been sufficiently heated so that asphalt will flow freely, the burner is returned to the base of the outer tank, keeping the supply of the inner tank in a hot liquid state. The SavPav is also designed to allow the placing of two burners in the base of the outer tank. With this arrangement the machine becomes a melting tank as well as a hot asphalt pouring machine and can be used for repairing cracks in old pavement where a larger supply melting tank is not available.

An Enclosed Model 3/8-Yard Shovel

AN enclosed model with complete protection from the weather for the operator of the power shovel has been announced by the Michigan Power Shovel Co., Benton Harbor, Mich. One of the features of the cab is clear vision for the operator at all times. The cab is designed so that the sides and front can be removed if desired and the interior is of sufficient size to permit complete servicing of the turn-table mechanism. The Michigan shovel is well-known as permitting full circle with no tail swing.



A Michigan Shovel with the Enclosed Cab for the Operator



The New Wood Hydraulic Hoist for 1½-Ton Dump Bodies

A Heavy-Duty Hoist for 1 ½-Ton Chassis

A NEW power-operated hydraulic hoist for heavy duty service on 1½-ton chassis has recently been placed on the market by the Wood Hydraulic Hoist & Body Co., Detroit, Mich. This new hoist, known as Model D6, rounds out the line of Wood hoists in the light truck field. No wood sills are required in installing the D6 hoist as the hoist and body come ready-mounted in a pressed steel subframe needing only to be bolted to the chassis.

The design is rugged and simple. A stocky seamless steel cylinder of 6-inch bore is so mounted that the piston rod pushes directly against the load. The lifting point has been kept at a considerable distance from the hinges to provide greater leverage and ease of operation.

All parts of the hoist have been carefully designed to give maximum strength for the rigid requirements of heavy duty service. In addition to the 6-inch cylinder, there is also an extra heavy steel piston rod, heavy duty hinges of drop forged steel, a full size oil pump, and heavy duty fittings. The entire Wood line of "C" bodies for 1½-ton chassis is furnished with the new D6 hoist.

Two New Welding Blow Pipes

TWO welding blowpipes embodying new ideas in blowpipe design have been announced by The Linde Air Products Co., 30 East 42nd Street, New York. A detachable valve body, to which the handle is secured by a simple and convenient locking device, enables the operator to change quickly from the standard to different handles without detaching the hose or hose connections and without the use of a wrench. Designated as the Prest-O-Weld Type W-105 welding blowpipe and the Type W-106 welding blowpipe, these two additions to the line have been designed to give Prest-O-Weld users a medium-pressure blowpipe comparable in range to the Oxweld Type W-17 welding blowpipe.

Both blowpipes are designed for use with the new type, one-piece hard-drawn copper welding tips. Although regularly supplied with a head angle of 60 degrees, this may be changed by the user to any angle desired. Ten different sizes of tips are available for use with the W-105 handle. A stem adaptor is available so that tips for the W-107 aircraft welding blowpipe may be used with the Type W-105. This makes the new blowpipe adaptable for work ranging from the lightest sheet metal welding to heavy welding work requiring a

No. 13 welding tip.

The W-106 blowpipe is similar in design to the Type W-105, but smaller. It is supplied with five sizes of tips, which cover a wide range of usefulness. The Type W-106 is particularly suited for automobile repair shops, for general light welding, bronze welding small parts, and for soldering. It is also suitable for sheet metal plants in production work. A stem adaptor is available so that the W-107 tips may be used with the W-106 handle.

A Vibrating Screen for Bucket Loaders

A NEW three-product vibrating screen for use with Model 62 heavy-duty self-feeding bucket loaders has just been introduced by the Barber Greene Co., 485 West Park Ave., Aurora, Ill. The screen is designed for operation in gravel pits, on road jobs or in any place where bulk material must be classified by size. It will take gravel direct from the bank in a pit and load it out as oversize gravel and sand. When such fine classification is not desired, the screen may be converted to a two-product unit by removing one screen cloth.

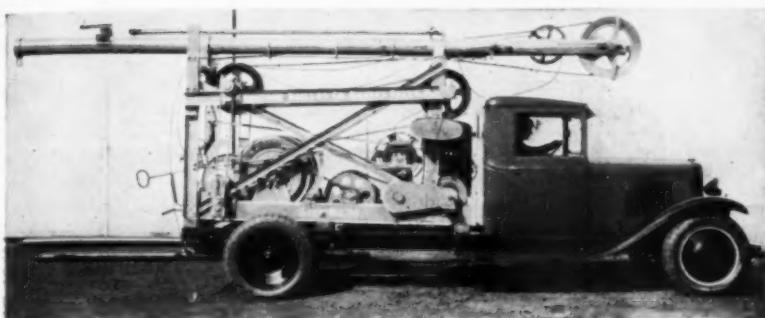
The new screen is made up of two screen cloths vibrated at 1,200 vpm by an alloy steel eccentric shaft driven by a power take-off direct from the main transmission of the loader. A belt that can be easily removed and rethreaded transmits the power to the screen. This belt is provided with an automatic take-up to compensate for stretch or contraction. The entire screen frame is vibrated in the center and cushioned on each end, and is counterbalanced so that no vibration is carried back to the loader frame.

Material discharged from the buckets of the loader falls first on a large screen cloth which removes oversize, carrying it off over a steel chute. Shaken through the first screen, the material drops on a finer mesh below. The very finest size falls through this cloth onto a rubber belt conveyor which carries it out and discharges it at a point 9 feet from the center of the machine. The material remaining on the second screen passes off over a chute directly in back of the loader. In this way two trucks may be loaded at the same time. The screen cloth is furnished in sizes to fit the individual user's needs.

The whole B-G vibrating screen is so mounted that it may be lowered to allow the loader boom to be rolled back for traveling and raised to position again by a hand hoist. Either loader or screen may be operated independently of the other.



The Model 62 Barber-Greene Bucket Loader with Vibrating Screen



The New Keystone No. 70 All-Steel Well Drill Mounted on a 1 1/2-Ton Truck

An All-Steel Well Drill for Light Truck Mounting

THE latest Keystone well drill announced by the Keystone Driller Co., Beaver Falls, Pa., offers a number of new features. The all-steel, strongly riveted frame of the new No. 70 offers greater length of life and a reduction in cost while maintaining high operating efficiency.

The machine exclusive of the derricks and tools can be conveniently packed in one box approximately 10 feet long, 4 feet wide and 6 feet high and weighing about 5,000 pounds. This eliminates the knocking down usually necessary for larger units when they are to be shipped, as well as the reconstruction of the outfit upon arrival at its destination.

The Keystone No. 70 has a 16-horsepower, 4-cylinder Waukesha engine, producing ample power and drives through two internal expanding clutches on a countershaft, to the rope drum and the drilling crank. Ball bearings are used on the drilling crank. The main shafts are $2\frac{1}{8}$ inches in diameter, which is oversize for the short span between bearings. This machine can be used with manila cordage or wire drilling cable. With the former it has a depth capacity of 300 feet and with the wire line a depth capacity of 600 feet. It has a long rapid stroke, 30 inches over the well and 60 blows per minute and will handle 1,400 pounds of drilling tools. This insures efficient operation with 3, 4, 6, 8 or 10-inch drill bits.

The recommended form of mounting for rapid and convenient use is a 1 1/2-ton truck. Any 1 1/2-ton truck with a long wheel base can be used and a larger 3 or 5-ton truck can be used without disadvantage. The extra truck capacity can often be employed for carrying extra tools. For operation in countries where roads are too rough for truck transportation, the machine is mounted on four iron wheels with wide treads and equipped with a tongue and doubletree for attaching draught animals or a drawbar for tractors. The telescoping pipe derrick which is 30 feet high extended is a novel feature. It offers unusual strength and rigidity at low cost.

Two New Convertible Shovels

TWO new convertible shovel-dragline-crane-clamshells, operated by gasoline, diesel or electric power, have recently been announced by Bucyrus-Erie Co., South Milwaukee, Wis. The new 32-B is a 1-yard model, among the features of which are the choice of power, either rope or chain crowd on the shovel and special extra long and wide mountings for soft ground dragline work. All continuously running shafts are mounted on ball bearings. The engine transmission gears are fully enclosed and run in oil as do the boom-hoist worm and gear and the reversing transmission gears for swing-

ing and propelling. There are only two bearings to a shaft. The transmission gears are silent with generated teeth, machine-cut from solid steel. There is an outside band power-take-off clutch and a positive power dipper trip. The machine has a box girder boom and outside handles, a single-shaft drive crawler mounting and an inserted dipper tooth.

The other new machine recently announced by this company is the 21-B, a $\frac{3}{4}$ -yard model. Among the features of this new convertible shovel are a power dipper trip, oversize clutches and brakes, power-set hoist clutches and operating levers which toggle in. The

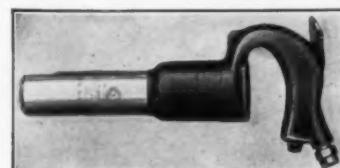
double-operating chocking brakes are applied from the operator's stand, a swing brake is provided for operating on a grade and the direction of the operating levers can be easily changed to suit the operator. When moving, the machine is steered from the operator's stand with the cab in any position. The propelling brake is also controlled from the stand and the friction brake locks the swing during propelling. The new Bucyrus-Erie three-side-vision cab permits the operator to see all parts of the work.



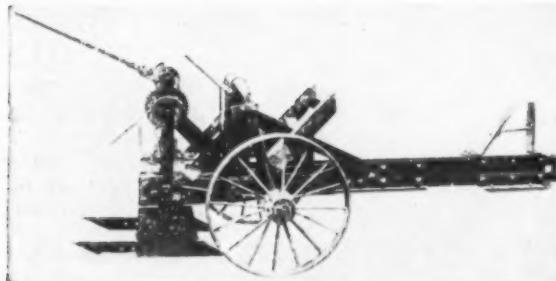
The New 32-B Convertible Shovel

Ring Valve Chipping Hammers

A NEW chipping hammer with only five major parts has been announced by the Chicago Pneumatic Tool Co., 6 East 44th Street, New York City. In the construction field this hammer, which delivers from 2,000 to 3,000 blows per minute, is particularly effective in trimming flush head rivets. The valve is a simple band ring placed over the end of the cylinder and having only $1/64$ to $1/32$ -inch movement, depending upon the size of the hammer. This construction permits the complete elimination of the valve case and dowel pins. Another feature is a new locking device which automatically tightens the handle, there being no slots, bolts or lock washers to cause trouble.



The New C-P Ring Valve Chipping Hammer



The Dukelow Hardpan Plow

A Two-Tooth Plow for Hardpan

THE Dukelow hardpan plow built of heavy structural steel beams and plates with two teeth, is now being manufactured by the LaPlant-Cheote Manufacturing Co., Inc., Cedar Rapids, Iowa. A heavy I-beam tongue acts as a full length shoe when the machine is plowing the maximum depth of 15 inches. The teeth are set on 24-inch centers and are reversible. Two steel wheels carry the plow when running free or when plowing less than the maximum depth. It is developed particularly for service in sand rock ledge, macadam, hardpan and loose rock.

The depth plowed is governed by a ratchet gear and lever plowing a uniform depth of 2 to 15 inches and 4 feet in width. The beam acts as a shoe, laying flat upon the surface of the material being plowed and providing leverage that will move hardpan and other stubborn materials. When the plow is in action the wheels idle or float ahead. The bumper on the front of the plow beam is provided for backing the plow when it is necessary to remove stumps, boulders, hardpan and frozen earth. The coupling for tractors is higher than the plow beam, thus eliminating any unnecessary maneuvering in backing. A steel cable is the only necessary connection between the plow and the tractor, giving plenty of room for turning or maneuvering from any point.

Machine-Built "Metal Shoulders"

WITH the development of a new highway shoulder specification in Indiana, requiring what are called "metal shoulders," a development has been made in the Insley shoulder finishing machine manufactured by the Insley Manufacturing Co., Indianapolis, Ind., to take care of the requirements of this specification. This type of shoulder requires the excavation of a trench along the edge of the pave-



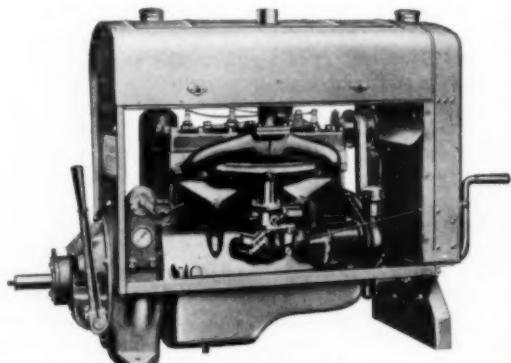
The Improved Insley Shoulder Machine, Showing the "Metal" Trench Close to the Slab, and the Slope Blade at the Right

ment 6 inches deep, 6 inches wide at the bottom and 18 inches wide at the top. The trench is filled with crushed stone or gravel. This provides a shoulder close to the slab of such a material that a motor car can safely run off the edge of the slab without becoming mired.

To meet this requirement the Insley shoulder finisher is built with an extra blade attached to the inner end of the main blade. When the main blade is set at the proper angle this extra blade scoops out a trench of exactly the required dimensions, a job which otherwise would be done by hand.

Other features of the Insley shoulder finisher include a slope blade which can be racked in or out and the angle of which can be changed to any angle or back slope. Another feature is the guide bar which runs along the edge of the concrete slab and takes the side draft imposed on the machine by a heavy blade full of dirt and also automatically fixes the dimensions from the slab to the edge of the shoulder.

A leveling device is furnished on the main blade and when once properly set gives the correct elevation of the outer edge of the shoulder in relation to the slab without the necessity of grade stakes being furnished by the project engineer.



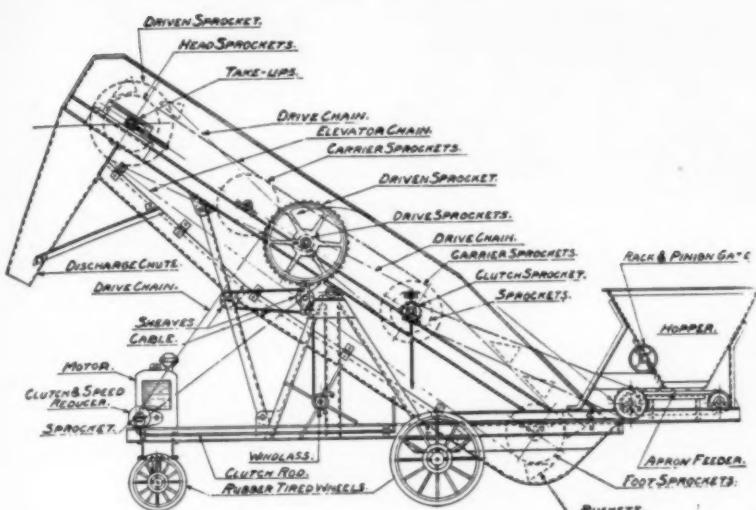
The New Waukesha 10-20-Horsepower Engine

A New Series of 4-Cylinder 10-20-Horsepower Engines

A NEW series of two small 4-cylinder engines of 10 to 20-horsepower size has been announced by the Waukesha Motor Co., Waukesha, Wis. Formerly engines under 20-25 horsepower were not included in the Waukesha line but with the addition of the FLJ and FJK known as the Agile Fours this company has filled the gap.

These smallest Waukesha engines have the standard Ricardo combustion chambers, a short, stiff crankshaft supported by three unusually large, bronze-backed replaceable bearings, full pressure oiling, built-in governor and a detachable flywheel housing. In addition to these features there is an unusual degree of flexibility in the facility for mounting accessories. It is possible to install a full-series type of oil filter, complete electric starting and lighting system, three point suspension, either battery or magneto ignition, all of which are available and add greatly to the desirability of the engine.

The full pressure oil system with drilled crankshaft and outside pressure adjustment is not commonly found in engines as small as these. The oil is distributed by a positively driven gear pump submerged in an oil reservoir and surrounded by the Waukesha patented oil level equalizer. This feature insures a positive supply of oil under full pressure at all levels and temperatures. Bolted to a pair of 4 x 4 skids, these engines may be moved from place to place easily and set to work as easily as an electric motor. The power take-off is entirely enclosed while a substantial sheet steel house protects the rest of the engine from the weather.



A Plant for Handling Emulsified Bituminous Concrete Paving

New Cold Mix Plant Uses Emulsified Asphalt

THE increasing popularity of emulsified asphalts and tars in the manufacture of bituminous concrete has led to the development of a plant which produces a high grade paving material with the emulsified product. This plant is manufactured by the Asphalt Equipment Co., Scottsdale, Pa. In this plant crushed slag, stone or gravel is thoroughly mixed with commercial emulsified bitumen by the immersion method, then delivered to the job and handled similarly to dry aggregate using either rakes, finishing machines, stone spreaders or even the end gate of the truck to spread it.

Emulsified bitumen permits the use of damp aggregate as effectively as dry ones. The plant is portable and through its use every particle of aggregate is thoroughly covered with a film of bitumen, thus eliminating the fat spots often found in cold-mix pavement.

This portable plant is built on a sturdy frame of ship channels well reinforced to prevent racking. The four wheels have 7-inch face rubber tires and are equipped with roller bearings. The front axle is pivoted to swing under the body and is provided with a drawbar for easy towing. The elevator boot, which is a part of the truck, is made of 3/16-inch plate and is bolted to the truck frame.

The accompanying diagram shows details of the machine. Aggregates are placed in the end hopper, the flow to the apron feeder being controlled by a rack and pinion gate. A well-built elevator of double strand construction carries the material to the discharge chute. The machine is powered with a 15-horsepower motor either gasoline or electric which is equipped with a speed reducer and a standard clutch.

A Blade Spreader and Straight-Edge for Road Work

A N attachment known as the Gledhill road adjuster for attaching to any standard 8-foot or larger road grader and which is adapted for the patrol of traffic bound or gravel or earth roads and for the spreading of all types of ready-mixed or mixed-in-place materials has been developed by the Gledhill Road Machinery Co., Galion, Ohio. The attachment consists of a front and rear mold-board.

These mold-boards are securely fastened on the left to a long straight-edge consisting of an I-beam shod with a runner. The rear mold-board is 1 1/2 feet longer than the front board allowing the overflow from the front mold-board to pass off at the end and be picked up by the rear mold-board and worked back in the opposite direction.

The adjusting bar runs from the right-hand side to the left-hand side of the machine and carries a spirit level. By adjusting this bar to any desired elevation or crown, the operator has only to watch the level and is assured that he is blading to the proper crown.

Who's Who among Manufacturers and Equipment Distributors, a portrait gallery of leaders in the construction equipment field, will appear in the January issue.

New Loader Handles 3 Cubic Yards Per Minute

OPERATORS of fleets of large-capacity trucks have constantly demanded loaders of greater capacity in order that truck loading time might be reduced to a minimum, and the cost of empty trucks awaiting their turn at the loader be saved. Geo. Haiss Mfg. Co., 142nd St. and Park Ave., New York City, has recently introduced the new Haiss Model 80 loader, a heavier, stronger and more powerful loader, which has a demonstrated average capacity in excess of 3 cubic yards per minute. One large New York City operator of sand and gravel yards reports a loading time of 3 1/2 minutes, putting up 15 consecutive runs of 12-cubic yard loads of crushed stone. This new loader has a 60-horsepower, 6-cylinder engine with intake air cleaner, oil filter, gasoline strainer and inbuilt throttling governor. It has a fully enclosed transmission, with all gears running in oil. It has the patented Haiss 3-foot per minute crowding speed and patented revolving propeller feeding device. The buckets measuring 22 x 12 x 10 inches are toothed for easier digging. The bucket elevator is interchangeable with a flight-conveyor snow boom for winter snow loading.

The weight of the new machine is 16,500 pounds. Manganese steel is used at vital parts to reduce maintenance and replacement costs.

Despite its great size and enormous capacity, the Model 80 is reported to be exceptionally easy to operate, with only 6 controls, each motion requiring only one hand movement. A skilled operator is not required, as it has been demonstrated that a few hours' experience will assure efficient operation of this new Model 80 self-feeding bucket loader.



The New 3-Cubic-Yard-Per-Minute Loader



The New Lansing Interlocking Concrete Chute

Interlocking Concrete Chutes

STEEL chutes for handling concrete from towers, which are beveled to permit interlocking, are manufactured by the Lansing Co., Lansing, Mich. These chutes are 6 inches deep, 17 inches wide at the delivery end, 18 inches wide at the entry end and the edges are bound with $1 \times 1 \times \frac{1}{8}$ -inch angles. At the upper end for additional support the end is bound with $1\frac{1}{2} \times \frac{1}{4}$ -inch angles. The chute is so designed that the sections interlock and permit the assembly of 50 feet of chute without the use of staging or other support. Individual chutes are carried in 8, 10 and 12-foot lengths.

A New Heavy-Duty Tractor and Road Roller

THE newest development in crawler tractors has just been announced by the Hercules Co., Marion, Ohio, in the Hercules Crawl Tractor which combines the tractor and road roller in one machine. This machine was developed to meet the requirements of heavy duty tractor users and to fill the need of heavy construction and road contractors, municipal, township, county and state highway departments, for a machine that would reduce the capital investment required for two separate pieces of equipment and supply one unit with the full utility of two.

The Hercules Crawl Tractor is capable of working safely on ground so broken and rough that most tractors would pitch or roll over sideways. Each rear crawler unit is free to rotate on its axle and combined with the gyroscopic front wheel, gives the machine a three-point suspension which compensates for uneven ground. Because of the three-point suspension, the machine can cross ditches or pass over steep hills without pitching or "nose diving."



The New Hercules Crawl Tractor

This new tractor is a standard Model 60, 80 or 100 Hercules chassis mounted on two rugged crawler tracks. These crawler tracks fit all Model 60, 80 and 100 Hercules road rollers including those now in service. The crawler tracks are mounted in ball and roller bearings. All that is necessary to convert the Hercules Crawl Tractor into a Hercules roller is to jack up the rear end, take off the crawler tracks, and replace the roller wheels. The Hercules scarifier can be used with either equipment. The Model 60 tractor develops a drawbar pull of 8,000 to 10,

000 pounds. All models have three speeds forward and backward, the direction and motion being controlled by the movement of a single operating lever. The standard Hercules tractor has a speed of $\frac{1}{2}$ mile per hour in low, $1\frac{1}{2}$ miles in second and $2\frac{1}{2}$ miles in high. As a roller the standard Hercules develops $1\frac{1}{2}$, $3\frac{1}{2}$ and $5\frac{1}{2}$ miles per hour in low, second and high gear, respectively.

All models of the Hercules Crawl Tractor are powered by a standard nationally known 6-cylinder engine with ample reserve power.

A Steel Wrench Built for Safety

THE new Lowell safety-steel reversible-ratchet wrench made by the Lowell Wrench Co., Worcester, Mass., is tested to stand the pull of 2,200 to 2,400 pounds and the manufacturer offers a new wrench free if the handle ever



The New Lowell Safety-Steel Wrench

breaks. This safety-steel wrench is made of electrically-treated metal of unusual strength. It has a fully enclosed ratchet and parts with absolute crushing action on hardened steel pawls. The wrench handle is 2 feet long and made to fit square or hexagonal nuts on both sizes $\frac{5}{8}$ to $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$ and $1\frac{1}{4}$ inches.

A New Roller Drive Chain

A ROLLER chain with a distinctly different joint construction than that common to all other roller chains has been announced by the Morse Chain Co., Ithaca, N. Y. Within the roller there are two joint members, a segmental bushing and a pin. The cross section of the pin is that of a round pin integral with a segmental bushing. On account of this construction, when a chain is flexing on or off a sprocket, all sliding movements of surfaces under load are between the pin and its bushing. Specifically, no movement under load occurs between the roller and the joint members. This feature insures uniformity of pitch throughout the life of the chain and tends toward smoother and quieter operation. The open spaces between the joint members provide reservoirs for oil, and lubrication is made more effective by the pumping action when flexing. This chain is made to manufacturer's standards and is interchangeable on all standard makes of roller sprockets.



The Cedar Rapids Bituminous Road Mixer

A New Bituminous Road Mixer

IT is a well-known fact that a gravel road is better than an old dirt road and it therefore follows that a gravel road properly bound with a bituminous product is a still better road than the loose dusty gravel road. The Iowa Manufacturing Co., Cedar Rapids, Iowa, has recently developed a machine which will pick up gravel from a road, batch the material accurately, mix it thoroughly and put it down as a hard-surfaced, dustless and low-cost road.

This Cedar Rapids road-mixer picks up the material from the road by means of a full floating elevator loading device mounted on caster wheels and controlled by the operator on the steering platform. This loader is equipped with adjustable wings for various widths of windrows and operates at 160 fpm. It makes a clean pick-up of all the loose material, which is brought to the center buckets by a ribbon feeder. When 200 pounds of aggregate, the maximum size for which is $2\frac{1}{2}$ inches, has been delivered to the aggregate batcher by the elevator buckets, this batcher trips automatically, which action operates the bitumen batcher which has been previously set to deliver a predetermined amount of bitumen. Under normal operating conditions this trips every 5 or 6 seconds. The oil batcher is of the single piston type and can be set to deliver from 0.7 to 2.2 gallons of oil per 200 pounds of aggregate. A pressure gage and indicating meter record the pressure on the batcher and the number of gallons that flow through it. It can be easily calibrated for various quantities.

The mixing is done in a thorough and accurate manner inside the pugmill, the main paddle shaft of which operates at 50 rpm and has 39 pairs of mixing blades. All parts are accessible and all wearing parts can be quickly and easily renewed. The mixed material discharges from the rear end onto the ground or onto a conveyor for truck loading.

An 850-gallon bituminous storage tank is insulated so that under all normal operating conditions the oil temperature drop will not exceed 2 degrees an hour. This tank can be filled from a truck tank while the plant is moving along and is equipped with a thermometer and a capacity gage. A set of coils provide quick heating facilities for the material in the tank. Heat is provided by a simple and reliable hand pressure type kerosene burner. Two burners are installed, to allow for the possible failure of one and to permit operations when the outside temperature is lower than is usually considered safe for road mix operations. According to the manufacturer, it takes less than 30 minutes to bring the bitumen from outside temperature up to near the boiling point.

All lever controls, including the steering controls, the raising and lowering controls on the front elevator and the forward and reverse controls for the plant are located on the control platform, and are banked for easy access to the operator.

Power is provided by an 85-horsepower Climax Blue Streak engine mounted on one side of the mixer. Variable speeds are obtained through the specially constructed transmission. Electrical starting and lighting equipment can be furnished on special order.

New Small Four-Cylinder Engines

A LINE of small modern 4-cylinder engines and power units designated as the Hercules IX series is now being manufactured by the Hercules Motors Corp., Canton, Ohio. The models available are IXA with a 3-inch bore, 4-inch stroke and 113.1 cubic inches displacement, and IXB with a $3\frac{1}{4}$ -inch bore, 4-inch stroke and 132.7 cubic inches displacement. These engines embody the usual Hercules features of simplicity of design and construction. In addition to their heavy-duty character these small engines have developed high speed operation for automotive and marine purposes.

A New Pneumatic Tractor Tire

A NEW development in tires for industrial tractors used for the operation of road machinery has been announced by the Goodyear Tire & Rubber Co., Inc., Akron, Ohio, in its pneumatic-lug tractor tire. These tires are designed and built by the same organization that pioneered pneumatic tires for trucks and buses. They are an entirely new product however, not a modified pneumatic tire, and are designed for tractor speed, tractor weights and chassis, and for tractor requirements for surefootedness and drawbar pull.

The Goodyear pneumatic-lug tire is made in five sizes, 32 x 6, 36 x 6, 38 x 7, 40 x 8, 42 x 9. The two latter sizes take the place of 40 x 10 and 42 x 12 steel wheels or 40-inch solid tires with no appreciable change in gear ratio or motor speed. The inflation pressure should be regulated according to load for best performance. The following table shows load and inflation recommendations for pneumatic-lug tires in power grader and road machinery service where speeds do not exceed 20 miles per hour.

Pressure	32 x 6 and 36 x 6	38 x 7	40 x 8	42 x 9
40	1260	1550	1865	2240
45	1375	1675	2000	2400
50	1490	1800	2140	2555
55	1600	1925	2280	2710
60	1730	2050	2420	2865
65		2175	2560	3020
70		2300	2700	3175
75				3330
80				3485



A Patrol Grader Equipped with Goodyear Dual Pneumatic-Lug Tires

Improved Methods in Concrete Placement

IT has been definitely proved in practice that a higher yield of concrete per bag of cement at the strength specified and complete workability with mixes too dry to be placed by hand can be secured by proper vibration of the concrete or concrete forms. Vibro-Cast equipment, manufactured by the Electric Tamper & Equipment Co., Daily News Building, Chicago, Ill., is furnished on a lease or rental basis for tri-monthly, semi-annual or annual periods. The basic principle of this equipment is that high frequency vibration applied to the forms or to the concrete tends to produce a denser concrete. For columns a special unit is clamped to the column forms and through its vibrations honeycombing is prevented. It is well known that hand spading of columns is very difficult and where heavy reinforcing is used arching of the dry mix is liable to occur unless concrete reinforcing or forms are adequately vibrated.



A Vibrator with Spud Attachment

The vibrator with the spud attachment illustrated is designed for use in bridge, deck and floor construction. With this machine, drier concrete can be placed without voids occurring around the structural and reinforcing members. The mix flows readily into place because of the impulses transmitted to the deck by the spud and the vibration of the forms. This prevents honeycombing on the bottom surface and eliminates expensive finishing. One or two spud machines are reported to suffice for the majority of jobs, easily handling the output of a 1-yard mixer.

The spud attachment consists of a semi-rigid handle attached by means of an ordinary rubber or canvas belt to the top part of the motor case. This handle

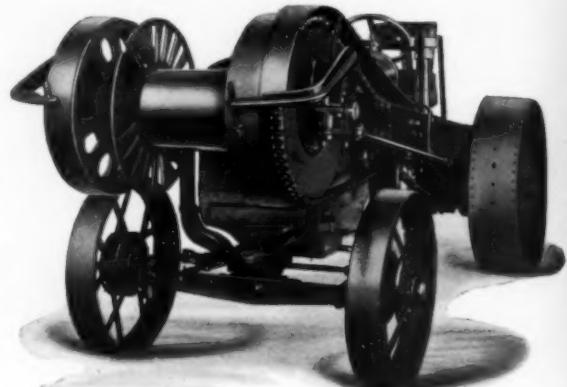
enables the operator to hold the machine without being subjected to its vibration. To the bottom of the motor is bolted a wood or metal spud of proper size and length to go between the reinforced members and reach the form. In beam and girder sections it is usually found necessary to use longer spuds than are commonly employed on the slabs.

A Hoist for All Loads

THREE models of the Bear Cat hoist are made by the Shaffer Specialty Co., 2440 E. King St., Tulsa, Okla., for mounting on McCormick-Deering tractors.

The Junior Bear Cat for mounting on the Model 20 has four forward speeds and one reverse and road speeds of 2, 4, 7, and 10 miles per hour. The line speeds of this model vary from 83 to 375 feet per minute and the load capacities for a single line from 8,041 to 1,750 pounds. The Senior model, also for mounting on a Model 20 industrial tractor, has four speeds forward and one reverse with road speeds of 2, 4, 7, and 10 miles per hour. The line speed of this model ranges from 65 to 295 feet per minute and the load capacity from 10,186 to 2,240 pounds for a single line.

The Super Bear Cat Hoist, which is designed for the 15-30 tractor, has three speeds forward and one reverse and road speeds of 2, 4 and 7 miles per hour. The line speed is from



A Bear-Cat Hoist Mounted on a Tractor

95 to 258 feet per minute and the capacity 10,678 to 3,910 pounds for a single line.

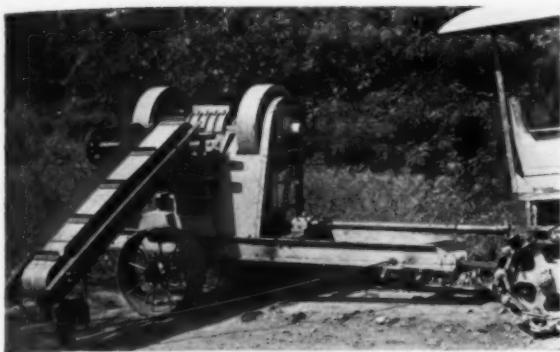
A Stone Spreader for Road Widening Work

STONE spreaders have been developed and used successfully for laying down courses of stone, asphalt mixtures and slag for bituminous construction but when it has been necessary to spread stone on shoulders or for widening, various make-shifts have been employed. The Galion Iron Works & Manufacturing Co., Galion, Ohio, has recently announced a spreader especially designed for road widening work. This machine spreads stone, gravel, slag or asphalt to the side of the pavement without its being necessary for the truck to leave the paved surface. Both the width and depth to which the material is spread are accurately controlled by easy self-locking adjustments.

The spreader is attached to the rear of the dump truck in the same manner as full width spreaders. To eliminate any overflowing of the spreader in its shallow end a wedge-shaped deflecting gate is placed in the rear corner of the truck to force the material directly into the deeper end of the spreader hopper. A combination of rollers and steel runners facilitates the easy movement of the spreader over hard or soft surfaces. The front of the runners are shaped so as to push aside any loose material in their path, thereby eliminating any variation in the depth to which the stone is spread.



The New Galion Road Widening Stone Spreader at Work



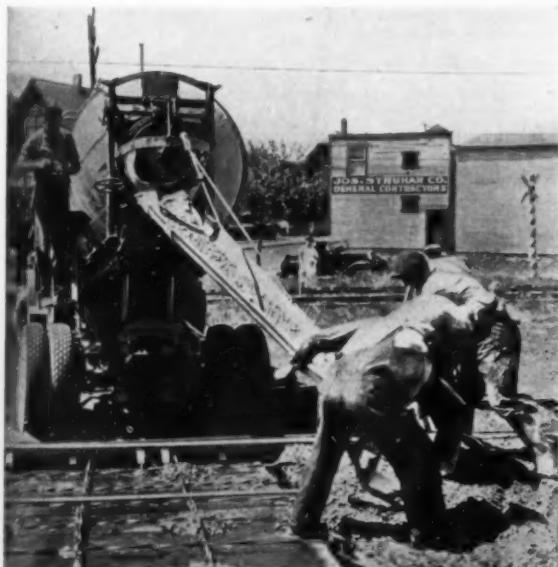
A Day Portable Jaw Crusher Equipped with Conveyor Belt for Loading

A Self-Loading Portable Crusher

To provide an easy means of feeding rock into a portable jaw-type tractor-drawn crusher, the Day Pulverizer Co., Knoxville, Tenn., has developed a self-loader. This loader, which is illustrated, is particularly useful when crushing the smaller sizes of stone such as field stone and gravel and rock taken from creeks. Also, it is valuable for loading oversize stones which have been removed from gravel roads by scarifying, raking, and hand picking. The stone loader is easily attached or detached at will. The loading capacity is sufficient to easily take care of the crusher capacity of from 90 to 150 tons of rock per 10-hour day. It consists of a cleated composition belt with skirt boards, is mounted on a caster at the end and is firmly attached to the crusher. It is driven by a belt drive from the crusher.

New Hoist Raises Truck Mixer 8 Feet from Ground

A NEW hoist for truck mixers, called the Jackass hoist, has been developed by the Chain Belt Co., Milwaukee, Wis., for its line of Rex Moto-Mixers and Moto-Agita-



The Rear of a Chain Belt Moto-Mixer Raised by the New Hoist to Give a Greater Area of Distribution of the Concrete

tors. The new hoist raises the mixer 8 feet from the ground for a greater delivery and spouting range. The hoist was developed with the cooperation of the Heil Co. of Milwaukee, manufacturers of the Heil hoist. It is a hydraulic hoist fitted to the rear end of the truck chassis and raises the discharge end of the mixer just as a Jackass raises his heels to kick. The Heil hoist used has been especially designed for this mixing unit. The lifting effort is exerted directly against the load to raise the drum the desired height. The cost of the concrete in the forms is said to be cut from 25 to 50 per cent.

From the height of 8 feet, the concrete can be spouted over an area approximately 75 per cent greater than heretofore. Sidewalks can be poured across parkways without wheeling. Building foundations and walls can be chuted even when the truck cannot get within 10 to 20 feet of the hole. Alleys and streets can be fanned their full width. The hoist raises the drum high enough to discharge into a 3-yard hopper. The flow of concrete can be regulated easily by the operator from

A Self-Propelling Pneumatic-Tired Ditcher

A NEW development in small ditchers has been announced by the Parsons Division, National Equipment Corp., Newton, Iowa. This Parsons Model 14 is designed to



The New Parsons Model 14 Ditcher

handle trenches and small pipe lines. Mounted on pneumatic tires, the Parsons 14 can travel from job to job under its own power while observing only the regulations applying to the operation of motor trucks over the streets and highways. No auxiliary equipment is necessary and it is ready for digging as soon as it arrives on the job. In a metropolitan area several small jobs may be handled in one day.

The machine is only 7 feet 3 inches high and 6 feet 9 inches wide, including the conveyor. It will cut a trench 6, 9 or 12 inches wide and 4 feet 6 inches deep. There are twenty digging speeds, forward and reverse, any one of which may be obtained through the operating levers, the highest speed being 16 feet per minute. Road traction is obtainable in four different speeds ranging up to 6.4 miles per hour. In one case in Iowa, this dumper traveled over 80 miles, from one town to another, in 14 hours.

Increased digging efficiency is secured through the special design of a front discharge type of self-cleaning bucket. For digging narrow trenches, from 6 to 12 inches wide, this bucket has shown advantages. The buckets and chain are cast integral and are not attached to separate chains. The power plant consists of a McCormick-Deering industrial tractor unit which furnishes ample power for all digging speeds.

LITERATURE FREE FOR CONTRACTORS

These especially selected catalogs and pamphlets of value to contractors are for free distribution. You will find it worth while to check these lists each month and write for the catalogs you need.

Wire Rope for Construction Equipment

365 Williamsport wire rope for construction equipment which is safe, reliable and well constructed is described in the new wire rope catalog and data book which the Williamsport Wire Rope Co., Williamsport, Penna., will be glad to send on request.

A Plow for Breaking Up Hardpan

366 The Dukelow hardpan plow which will break up sand rock ledge, macadam, hardpan and loose rock and is a two-tooth plow built of heavy structural steel beams and plates is described in Form 34 which may be secured from the LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

A New Loader Handles 3 Cubic Yards Per Minute

367 The Geo. Haiss Mfg. Co., 142nd St. and Park Ave., New York, has recently announced the new Model 80 loader which has a demonstrated average capacity of 3 cubic yards per minute. Complete information regarding this loader will be furnished promptly by the manufacturer.

Scraper Mucking Hoists

368 Sullivan scraper mucking hoists of the electric, turbinair and gasoline types, for use in scraper mucking in drifts or tunnels or for draglining or scraper loading in outdoor work for such tasks as trimming stockpiles, hauling sand, gravel or clay, or for loading trucks or cars with a slide, are described in Bulletin 76-N which the Sullivan Machinery Co., 814 Wrigley Bldg., Chicago, Ill., will be glad to send on request.

A 6-Cylinder Dual Drive Motor Grader

369 The 6-cylinder Austin 77 dual drive motor grader with leaning front wheels and front scarifier, and which can also be equipped with pneumatic tires or crawler treads, snow blade and snow plow for winter use, the Super Service blade bit for economical maintenance or a special double-decked mold-board for oil-mix work, is described in Bulletin 1239 which may be secured by those interested from the Austin-Western Road Machinery Co., 400 No. Michigan Ave., Chicago, Ill.

A New Vibrating Screen for Bucket Loaders

370 A new three-product vibrating screen for use with Model 62 heavy-duty self-feeding bucket loaders has been announced by Barber-Greene Co., 485 W. Park Ave., Aurora, Ill. A complete description and illustration of this machine will be furnished on request by the manufacturer.

A Slide Rule to Measure Truck Power

371 The Reo Motor Car Co., Lansing, Mich., will be pleased to send to Reo Speedwagon owners and prospects a celluloid slide rule which tells accurately the number of gross pounds including truck and load, that a Reo Gold Crown engine is capable of pulling under varying conditions, noting tire sizes and rear axle ratios.

A New Truck Mixer and Agitator

372 The new Smith truck mixer and agitator which is made in two sizes, 1-1/2-cubic yard and 2-3-cubic yard, is adaptable to any make of truck of sufficient capacity and has a number of new features is described in literature which the National Equipment Corp., N. 30th St. and W. Concordia Ave., Milwaukee, Wis., will be glad to send on request.

Reinforced Roads and Streets

373 This is the title of a catalog describing the use of American Steel & Wire reinforcing fabric for long pavement life and low maintenance costs for concrete roads and streets. Copies of this booklet may be secured without obligation from the American Steel & Wire Co., 208 So. LaSalle St., Chicago, Ill.

A Complete Line of Contractors' Hose

374 Continental Rubber Works, Erie, Penna., will be glad to send to those interested complete information in regard to all types of Continental pile driving, steam, water, jet, air, rock drill, sand suction and pump diaphragm hose for use on all types of construction jobs.

Rugged Reliable Road Rollers

375 Buffalo-Springfield road rollers which are built in every practical weight and size, steam and motor driven, in 3-wheel or tandem style, are described in literature which the Buffalo-Springfield Roller Co., Springfield, Ohio, will be glad to send on request.

Cast Iron Pipe

376 The use of U. S. cast iron pipe in large diameters, among the features of which are durability, low maintenance cost and long life, is described in an attractively bound and illustrated book entitled "Along Large Cast Iron Lines" which the United States Pipe & Foundry Co., Burlington, N. J., will be glad to send on request.

Asphalt for Roads and Streets

377 Specifications and other information in regard to Standard asphalt for surfacing, penetration work, asphaltic concrete, sheet asphalt paving and all types of patching as well as asphalt joint fillers and waterproofing asphalt may be secured by those interested from the Standard Oil Co. of New York, 26 Broadway, New York City.

Starting and Lighting Units

378 Information and suggestions in regard to the use of starting and lighting units on construction equipment which make possible night as well as daytime use and allow engines to be shut down while the equipment is idle, making for economy as well as efficiency, may be secured from the Electric Auto-Lite Co., Toledo, Ohio.

Pumps and Well Points for Dewatering Jobs

379 Literature describing Moretrench well points, header pipes and combination self-priming and vacuum pumps giving high continuous vacuum for dewatering construction jobs may be secured by interested contractors from Moretrench Corp., 90 West St., New York City.

New Oil Burning Heater

380 The new Honhorst oil burning asphalt heater is described in Pamphlet No. 15 which the Jos. Honhorst Co., 1016 W. 6th St., Cincinnati, Ohio, will be glad to send on request. Other literature describing the complete line of Honhorst heaters in portable and stationary types of from 25 to 200-gallon capacities is also available.

Air Compressors

381 Thor air compressors, among the features of which are a super-charger and the direct-connected design which eliminates vibration and reduces maintenance cost, are described in Catalog No. 104 which the Independent Pneumatic Tool Co., 248 So. Jefferson St., Chicago, Ill., will be glad to send on request.

Wagons for Dirt Moving

382 Complete information in regard to Marion Mules, the oscillating front axle of which permits an even haul over uneven roads, excavations, or fills, and which can be furnished with rubber tires, steel wheels or crawlers as regular equipment, can be secured by those interested from Marion Mules, Inc., Marion, Ohio.

A Safety Wrench with a 2-Foot Handle

383 The Lowell safety-steel reversible-ratchet wrench with a 2-foot handle tested to stand a pull of 2,200 to 2,400 pounds and a new wrench free if the handle ever breaks is described in the literature of the Lowell Wrench Co., Worcester, Mass.

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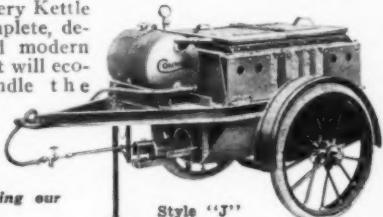
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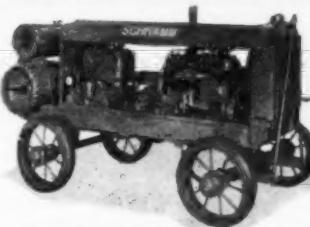
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McCURDY STEEL PRODUCTS COMPANY
Ada Ohio

A New 240-Foot Portable Air Compressor

384 The O.K. Clutch & Machinery Co., Columbia, Pa., has announced a new 240-foot, 4-cylinder-type air compressor, all parts of which are interchangeable with the 2-cylinder, 120-foot compressor with the exception of the crankshaft and cylinder block. Complete information regarding this may be secured direct from the manufacturer.

Enclosed Model of Small Power Shovel

385 The Michigan Power Shovel Co., Benton Harbor, Mich., will be pleased to send a complete description and illustrations of the new model Michigan shovel with enclosed cab for the operator. This shovel offers full circle loading with no tail swing.

A Hot Asphalt Pouring Machine for Joints

386 The Dobbie Foundry & Machine Co., Niagara Falls, N. Y., will be pleased to send its illustrated circular describing the SavPav, a hot asphalt pouring machine designed scientifically to pour hot asphalt in pavement joints. This machine has several unusual features such as a special guide to prevent spilling.

A New 4-Cylinder 10-20-Horsepower Engine

387 A complete description of the new Waukesha FLJ and FJK 4-cylinder engines of 10 to 20 horsepower with all of the features of the larger units may be secured direct from the Waukesha Motor Co., Waukesha, Wis.

Lubricant for Construction Equipment

388 D-A Lubricant Co., Inc., Indianapolis, Ind., will be glad to send to interested contractors full information in regard to D-A heavy-duty fluid lubricant for tractors, trucks, cranes, shovels and other heavy-duty equipment.

A Complete Line of Derricks

389 Complete information in regard to the full line of Sasgen derricks and winches may be secured by interested contractors from the Sasgen Derrick Co., 3101 Grand Ave., Chicago, Ill.

Dependable and Economical Trucks

390 Dodge Bros. Corp., Detroit, Mich., will be glad to send to interested contractors complete information in regard to Dodge trucks with standard line ranges in payload capacities from 1,200 to 4,300 pounds and heavy-duty line ranges from 3,600 to 11,175 pounds and up, for tractor or trailer service.

A Complete Line of Shovels

391 Osgood Co., Marion, Ohio, will be glad to send to those interested complete information in regard to the line of Osgood shovels, among the features of which are speed, reliability, accessibility, full dippers, plenty of power and low cost per yard of dirt handled.

A Hand Book of Road Building Material

392 The latest edition of the Ceco handbook of road building material issued by the Concrete Engineering Co., Omaha, Nebr., contains helpful data concerning Ceco welded fabric in styles and sizes especially adapted to paving work, the well known Ceco triangle fabric and reinforcing bars. Other accessories include marginal bar supports, both single and double, dowel bar supports, tapered stake pins, temporary road strip caps, dowel sockets and road guard. The book which is well illustrated also contains a complete field book for contractors.

Rail Filler for Track Paving

393 Philip Carey Co., Lockland, Cincinnati, Ohio, will be glad to send to those interested prices and engineering data on Carey Elastite rail filler which, when placed in the web of rails or tracks, absorbs the vibration and prevents damage to the adjoining pavement. The filler is a tough asphalt compound, premolded to fit any rail section, offers resistance to shock, temperature changes and moisture and is quickly installed.

Warning and Safety Torches

394 Complete information in regard to Toledo torches for warning and safety lights which are dependable, economical and defy any kind of weather may be secured by interested contractors from the Toledo Pressed Steel Co., Toledo, Ohio.

The New Diesel Tractor

395 Caterpillar Tractor Co., Peoria, Ill., will be glad to send to those interested a complete description of the new Caterpillar diesel tractor, among the features of which are the complete removal of all field adjustments and timing features from the fuel injection apparatus, complete inclosure and dustproofing of the vital operating parts, a fuel injection apparatus fully coordinated with the combustion process and the same simple operating control as is used on the gasoline tractor engines.

A Complete Line of Pipe Tools

396 Catalog No. 32 describing the complete line of Beaver pipe tools which are made in a variety of types and range of sizes to meet the many requirements of pipe tool users has recently been issued by the Borden Co., Warren, Ohio. Copies of this attractive and interesting booklet may be secured from the company on request.

A New Shovel-Crane-Dragline

397 Complete information in regard to the new K-48 all-purpose unit which serves as a shovel, crane, engine hoist or dragline, and is arranged for gasoline engine, diesel engine or electric motor drive, may be secured from the Link-Belt Co., 300 W. Pershing Road, Chicago, Ill.

Flexible Couplings for Construction Equipment

398 An attractive and well-illustrated booklet, Bulletin No. 47, describing the features and uses of Morse flexible couplings for all kinds of construction equipment, may be secured by those interested from the Morse Chain Co., Ithaca, N. Y., who will be glad to send copies on request.

An Integral Waterproofing Admixture

399 The Barnsdall Tripoli Co., 2111 Railway Exchange Bldg., St. Louis, Mo., has published a new Bulletin E describing the use of Barnsdall Admix, an integral waterproofing for concrete, mortar, stucco, and cement products. Copies of the bulletin will be sent to those interested in receiving it.

Tilting and Drum-Type Mixers

400 Construction Machinery Co., Waterloo, Iowa, will be glad to send to interested contractors complete information in regard to its line of Wonder tilting and Master drum-type mixers as well as hoists, saw rigs and pumps.

Taking the Honeycomb Out of Concrete

401 The Vibro-Cast method of insuring the removal of honeycomb from concrete in columns, tunnels, slabs, deep beam sections, in pipe encasements and thin wall sections is completely described in a booklet "The Biggest Step Forward Ever Made in Concrete" which may be secured free from the Electric Tamper & Equipment Co., Daily News Bldg., Chicago, Ill.

Hand Shovels That Piece Workers Use

402 One of the best measures of the value of a hand shovel is whether or not it is used by piece workers. For years piece workers have bought Pony, Genuine O. Ames, Monongah or Wyoming Red Edge shovels which never deliver toy loads. Complete information regarding these shovels may be secured from the Ames-Baldwin-Wyoming Shovel Co., North Easton, Mass.

Ring Valve Chipping Hammers

403 A new line of ring valve chipping hammers which deliver 2,000 to 3,000 blows per minute and have only five major parts has been announced by the Chicago Pneumatic Tool Co., 6 East 44th St., New York City. These hammers are completely described and illustrated in a new circular.

New Cold-Mix Plant Uses Emulsified Asphalt

404 A complete proposal and specifications of the Doorley plant for mixing bituminous concrete using emulsified asphalt or tar may be secured from the Asphalt Equipment Co., Scottsdale, Pa.

High Grade High Pressure Paver Hose

405 Maltese Cross Multi-Cord hose, a super grade of rubber hose designed to give extraordinary long service under the most severe working conditions, is manufactured by the Hewitt-Gutta Percha Rubber Corp., Buffalo, N. Y., which will be pleased to send a description and detailed specifications and prices on request to any contractor.

Steel Liner Plates for Tunnels

406 The Truscon Steel Co., 6100 Truscon Ave., Cleveland, Ohio, will be pleased to send its new complete catalog on Truscon steel liner plates for permanent underground work such as railroad, sewer, water and mine tunnels, caissons and shafts to any contractor engaged in this type of work.

New Large Capacity Portable Electric Plants

407 The Kohler Co., Kohler, Wis., has announced a 20-kw D. C. and a 25-kva A. C. portable electric plant powered with a 6-cylinder motor and equipped with a 12-volt starting battery for use in construction camps and on construction projects. A complete description will be sent on request.

A Combined Tractor and Road Roller

408 The Hercules Crawl Tractor recently announced by the Hercules Co., Marion, Ohio, combines the usefulness of a tractor and road roller in one machine. A complete description of this machine with illustrations may be secured direct from the manufacturers.

A New 6-Cylinder Heavy-Duty Tractor

409 A complete description of the new Allis-Chalmers Model L tractor, among the features of which are high road clearance, unit construction, easy accessibility to all working parts, 6-cylinder engine and six speeds, may be secured by those interested from the Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

Low Cost Roads

410 Complete information in regard to Standard asphalt road oil for use in constructing low cost roads as well as for maintenance of roads and streets may be secured by those interested from the Standard Oil Co. of Indiana, 910 So. Michigan Ave., Chicago, Ill.

Rock Crushers for All Sizes of Materials

411 Rock crushers built in three standard sizes to crush all grades of rock from hard granite, trap rock or gravel to soft sandstone, are made by the New Holland Machine Co., New Holland, Pa., who will be pleased to send complete descriptions on request.

An Improved Pipe-Handling Boom

412 The Resistocor Engineering Corp., Muskogee, Okla., has developed the Seminole pipe-handling boom which has a number of exclusive features, including only two levers which are used to control the operation of the boom member. This equipment is described in literature which may be secured on request.

A New Wall Form Tie and Spreader

413 Free information regarding the Spedee Spreaderclamp for wall forms which is placed from the outside of the form and which will sustain the pressure of 2 1/2 tons each may be secured from R. B. Everett & Co., Houston, Texas.

A New Fully-Convertible Shovel

414 Literature describing the Austin Model 55 new fully-convertible 1/2-yard shovel, which is equipped with a 50-horsepower Waukesha gas engine, has a standard shovel boom 16 feet 6 inches long, a twin dipper stick 12 feet long and a capacity of 11 cubic feet struck measure, may be secured by those interested from the Austin Machinery Corp., Muskegon, Mich.

An All-Steel Well Drill for Light Truck Mounting

415 The new Keystone No. 70 all-steel well drill in which has been effected a diminution in weight and bulk and which is readily mounted on 1 1/2-ton trucks is completely described in a circular which may be secured from the Keystone Driller Co., Beaver Falls, Pa.

Interlocking Concrete Chutes

416 The Lansing Co., Lansing, Mich., will be pleased to send its literature describing Lansing interlocking concrete chutes made in 8, 10 and 12-foot lengths which interlock and permit the assembly of 50 feet without the use of staging or other support.

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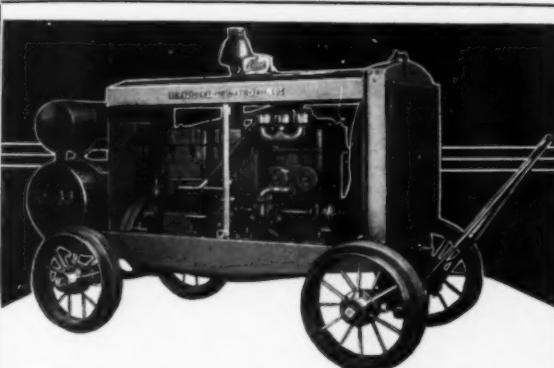
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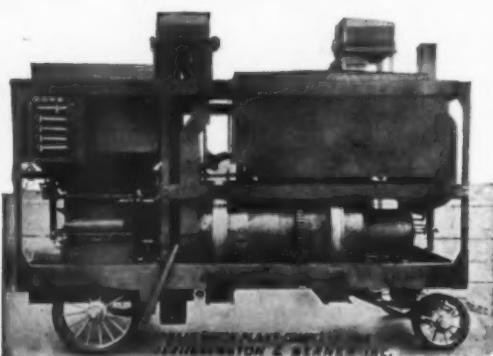
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470 For

Contractors and Engineers Monthly

DIRECTORY OF EQUIPMENT DISTRIBUTORS

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BEYERS Full-Revolving Shovels and Cranes
CHAIN BELT "Rex" Mixers, Pavers, Pumps, Saw Rigs, Etc.
DIXYOL Lubricating Greases
HAJSS Loaders and Conveyors
GALION Road Graders and Machinery
PIONEER Screening and Crushing Plants
EVAS Heavy Duty Trailers
TOLEDO Torches
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BLAW-KNOX—"Ball" Wagon Graders

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HART PARR Tractors
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RANSOME Concrete Mixers, Pavers
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ERIE—Bins
JAEGER—Concrete Mixers
ORR & SEMBOWER—Concrete Mixers & Hoists
AMERICAN STEEL & WIRE Co.—"Monitor" Wire Rope
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Erie Road Rollers
General Shovels, Cranes, etc.
Gardner-Denver Portable Compressors, Jack Hammer, etc.
Goroco Spreaders
Huber Road Rollers
Jaeger Concrete Mixers, Pavers, Pumps, Hoists
Jumbo Wheel Scrapers
Lima 101 Shovels
Madsen Portable Paving Plants
Master Rotary Scrapers
Milwaukee Gas Locomotives
Pioneer Crushing, Screening and Loading Plants
Serviced Expansion Joint
Snow King Rotary Snow Plows
Williamsport Wire Rope and Aerial Tramways

MINE & SMELTER EQUIPMENT CO.

Construction & Mining Machinery
306-12 South 7th Ave. Phoenix, Ariz.

Representing

NATIONAL Air Compressors
LINK-BELT Shovels, Cranes and Draglines
LAKEWOOD Mixers, Concrete Placing Equip.
CLEVELAND Rock Drills, Air Tools, Etc.
NOVO Hoists, Engines and Pumps
LINCOLN Stable Arc Welders and Motors
EDWARDS Wire Rope
STRAUB Milling Equip.
DIESEL Engines

Ronstadt Hardware & Machinery Co.

"Pioneers in Good Merchandise"

TUCSON ARIZONA
GALION Graders, Rollers, etc.
McCORMICK-DEERING Industrial Tractors, Engines

INTERNATIONAL Motor Trucks
ATLAS Scrapers, Powder Dirt Movers
BAKER Earth Moving Equipment
BAY CITY Shovels, Cranes, Draglines
ORD Concrete Finishing Machines
MUNICIPAL Sprinklers, Flushers, etc.
STERLING Hoists, Contractors' Pumps
AMERICAN "Trulay" Wire Rope
RAY Road Signs
POMONA Turbine Pumps
MYERS Pumps
SPEARWELL Oil Distributors

ARKANSAS FOUNDRY COMPANY IRON AND STEEL

Little Rock Arkansas

Representing
AMERICAN STEEL & WIRE CO.—Wire Rope and Cable
NATIONAL STEEL FABRIC CO.—Wire Mesh
MILWAUKEE CORRUGATING CO.—Lath and Building Products
MAJESTIC CO.—Coal Chutes and Building Products
IRVING IRON WORKS—Subway Grating
CARTER BLOX-ON-END FLOORING CO.—Industrial Wood Flooring
LINDE AIR PRODUCTS CO.—Purox Welding and Cutting Equipment
DETROIT STEEL PRODUCTS CO.—Fenestr Steel Sash and Holorb Roof
SAINO MANUFACTURING CO.—Automatic Fire Doors
Also Structural and Reinforcing Steel and Steel Building Products

ARKANSAS TRACTOR & EQUIP. CO.

424 East Third St. Little Rock, Ark.

Representing
CATERPILLAR—Tractors, Graders, Cutting Edges
WILLAMETTE-ERSTED—Winches
LaPLANT-CHOATE—Wagons, Bulldozers
KILLEFER—Scrapers, Road Rippers, Scarifiers
SPEEDER—Shovels
PIONEER—Screening, Crushing, Loading Plants
EUCLID—Wagons, Scrapers and Bulldozers
ATECO—Hydraulic Dirtmovers and Scarifiers
ATHHEY—Wagons
ATLAS—Wheel Scrapers
W-K-M—Booms
General Contractors' Equipment

J. B. HARBISON EQUIPMENT CO.
209 Spring St. Little Rock, Ark.

Representing

NORTHWEST Shovels and Draglines
CHICAGO AUTOMATIC Conveyors
RYAN Power Graders and Dual Blade Motor Patrols
WILLIAMS Clampbeams and Dragline Buckets
HELTZEL Bins, Weighing Hoppers & Road Forms—Curb, Gutter & Sidewalk Forms
GENERAL EXCAVATOR CO. Shovels and Cranes

WIARD Plows & Grade Roots
LUEDINGHAUS Dump Wagons
AUSTIN Trenchers & Backfillers
TOLEDO Trenchers
CARBIC Flood Lights
REPUBLIC Concrete Mixers
UNION Steam Hammers
GOOD ROADS Crushers & Asphalt Distributors

CONCRETE MACHY. & SUPPLY CO.

777 E. Gage Ave. Los Angeles, Calif.

Representing

AMERICAN Cable
ARCHER Towers & Chuting
BUTLER Bins & Batching
BUCKYRUS-ERIE Shovels and Cranes
BLYSTONE Products Mixers
CLYDE Hoists & Derricks
GARDNER-DENVER Compressors
HARDY Sack Cleaners and Balers
TRACKSON Crawlers, Shovels
Member: Associated Equipment Distributors

HOMELITE Pumps and Generators
HOTCHKISS Road Forms
LE ROI Engines
PARSONS Excavating Mchys.
REX Mixers and Pavers
REX Pumps and Saw Tables
RED STAR Wheelbarrows and Carts
SERVICED Expan. Joints
STEARN'S Elev. & Conveyors
WILLIAMS Buckets and Heavy Duty Trailers

SHEPHERD TRACTOR AND EQUIPMENT COMPANY

514-20 West 12th St. Los Angeles, Calif.

Representing

"CATERPILLAR" Tractors
"CATERPILLAR" Road Graders
KILLEFER Scrapers, Scrifiers, Road Dism
ATECO Dirt Movers, Bulldozers
ATHENY Truss Wheel Trailers
BAKER MANEY Scrapers
LaPLANT-CHOATE Crawler Wagons
MASTER Backfillers, Pipe Line Equipment

JOE LYONS MACHINERY CO.

Contractors' Equipment and Supplies
112 Louisiana St. Little Rock, Ark.

Representing

REX—Mixers and Pavers, Mortar and Plaster Mixers, Pumps and Saw Rigs
BLAW-KNOX—Curb, Gutter and Road Forms, Batching, Bins, Clampbeams, Truck Turntables
RED STAR—Wheelbarrows, Concrete Carts
SKELETON—Shovels
BUCKYRUS-ERIE—Power Shovels, Cranes and Draglines
LIDDEWOOD—Hoists, Derricks
MORROW—Gravel Screening and Washing Plants
INGERSOLL RAND—Compressor, Drills, etc.
UNION—Wire Rods
WAUKESHA-FULLER & JOHNSON—LEROI—Engines
BATES—Bar Ties
BARBER-GREENE Lenders
Also anything else a contractor uses

CROOK COMPANY

1220 South Grand Ave. Los Angeles, Calif.

Southern California Distributors

Allis Chalmers
Rome Manufacturing Co.
Master Equipment Co.
Davis Manufacturing Co.
Brennen Company
Osgood Company
Buffalo-Springfield Co.
Ransome Concrete Machy. Co.
W. R. Meadows Company
Heitzel Steel & Iron Co.
New Engine Company
Morton
D-A

Monarch Tractors
Graders
Scrapers, Backfillers
Hydraulic Scraper
Scrapers, Road Rippers, Implements
Shovels, Cranes, Hoes
Rollers
Pavers, Mixers, Towers
Expansion Joints
Bins, Batching, Road Forms
Engines, Hoists, Pumps
Scrapers, Dirt Movers
Lubricants

SMITH BOOTH USHER CO.
LOS ANGELES

1910 Santa Fe Ave. 228-238 Central Ave.
BARBER-GREENE—Ditch
Excavators, Loaders
CEDAR RAPIDS—Crushing
Plants
EASTON—Industrial Cars
FOUR WHEEL DRIVE—
FWD Trucks
FREEMAN—Turntables
GALION—Graders, Rollers
HERCULES—Power Units
JAEGER—Mixers, Hoists,
Pump, Tower Equipment
JOHNSON—Bins and Hop
perons
LAKEWOOD—Road Finish
ers, Forms, Chuting, etc.
UNION IRON WORKS—
Pile Driving Hammer
Member: Associated Equipment Distributors

MACWHYTE—Wire Ropes
MOHAWK—Asphalt Batching
MULTIFOOTE—Pavers
MUNDY—Hoists
SAUERNAU—Cableway R
elators, Power Driv
FWD Trucks
SCHRAMM—Compactors
SIMPLEX—Tread Brads
SKILSAW—Portable Ele
ctric Saws
THEW—Shovels and Crane
Union IRON WORKS—
Pile Driving Hammer
UNIVERSAL—35" Saws
and Cranes

KERN—LIMERICK, Inc.
115 No. Spring St. Little Rock, Ark.

Representing

STOCKLAND Graders, Small Road Tools
KOEMRING Pavers, Shovels
Cranes
T. L. SMITH Mixers and Pavers
INSLEY Mast Hoists, Building Towers
PARSONS Excavators and Backfillers
C. H. & E. Pumps, Saw Tables and Hoists
CLEVELAND Roads, Drills, etc.
RESILIFLEX Guard Rail
ELICOTT Dredges
JOHNSON Bins & Batching

HUBER Road Rollers
HUBER RAPIDS Crushers, and Gravel Plants
SIDNEY Steel Scrapers, Wheelbarrows, Tools
SCHRAMM Air Compressors, Drills, Tools, Etc.
WICKWIRE-SPENCER Wire Mesh and Cables
CONNEAUT Hand Shovels, Cutting Edges for all makes of Graders
MONARCH Tractors
LITTLEFORD Asphalt Heating and Equipment
TRACKSON Crawlers, Hoists
LINN Tractors

WE DO NOT CHOOSE TO RUN—

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**CONTRACTORS AND ENGINEERS
MONTHLY**

470 Fourth Ave. New York

THE BROWN-BEVIS CO.

49th St. & Santa Fe Ave. Los Angeles, Calif.

Distributors

Adams Graders
Archer Towers
Barton Pumps
Bay City Truck Cranes
Buckley Trench Machines
Burd Stone Spreaders
Carr Pumps
Wescon Concrete Mixers
Continental Engines
Easifl Wagon & Scrapers
Plymouth Locomotives
Fuller & Johnson Engines
General Shovels, Cranes
Member: Associated Equipment Distributors

Hales Loaders, Conveyors
Huber Gas Rollers
Lidgerwood Hoists, Cableways
Link Belt Shovels, Cranes
Littleford Asphalt Heaters
Michigan 3/4yd. Shovels
Moritz-Bennett Shoulder Machines
Owen Chalmers Backhoes
Page Drilling Backhoes
Sullivan Air Compressors
Williamsport Wire Ropes

GARLINGHOUSE BROS.

2416 E. 16th Street, Los Angeles, Calif.

Southern California Distributors for

BLAW-KNOX CO.—Steel Forms, Road Building Equipment
A. W. FRENCH & CO.—Road Finishers
BROWNING CRANE & SHOVEL CO.—Shovels, Cranes
DOMESTIC ENGL. PUMP CO.—Road Builders & Dewatering Pumps
HANSON CONCRETE MACHY. CO.—Concrete Pacing Equipment
A. LESCHEN & SONS ROPE CO.—Wire Ropes
MCKIERNAN-TERRY CORP.—Pile Hammers & National Hoists
KNICKERBOCKER CO.—Concrete Mixers, Saw Rigs
WORTHINGTON—Portable Compressor, Jackhammers, etc.
MALL TOOL CO.—Concrete Surfaces
STREET BROS.—Cableways
DOBBIE—Derrick & Derrick Fittings
DAYTON WHIRLEY—Wiley Whirlers
Member: Associated Equipment Distributors

B. HAYMAN CO., Inc.

118-128 N. Los Angeles St. Los Angeles, Calif.

Representing

ATLAS SCRAPER CO.—Rotary Wheeled Scrapers & Power Scrapers
BRENNERIS MFG. CO.—Road Rippers, Scrifiers and Deep Tillage Implements
F. L. CARSWELL MFG. CO.—Road Graders, Road Plows and Rudder Plows
DETROIT HARVESTER CO.—Detroit Mowers and Street Sweepers
FOOTE BROS. GEAR & MACH. CO.—Bates Steel Mules, Tractors & Stockland Road Graders
SCHRAMM, INC.—Air Compressors
TRACKSON—Trackson Loaders
WILLAMETTE-ERSTED CO.—Portable Hoists

CORNELL TRACTOR COMPANY

10 Abbott St., Salinas, Calif.

Branches:

Watsonville

King City

Distributors:

"Caterpillar" Tractors
"Caterpillar" Combines
"Caterpillar" Graders
John Deere Implements
Killefer Manufacturing Corporation
Farm Implements & Road Machinery
"ATCO" Road Machinery
"Reo" Trucks

EDWARD R. BACON CO.

CONSTRUCTION EQUIPMENT

Folsom at 17th St. San Francisco

Adams Wheel Graders
Bart Stone Spreaders
Byars Shovels and Cranes
Carr Shredders
Cedar Rapids Crushers
Cleveland Trenchers
Eastern Industrial Cars
Hercules Power Units
Homelite Pumps
Huber Rollers
Jaeger Concrete Mixers
Johnson Bins and Batching
Midwest Locomotives
Schramm Air Compressors
Member: Associated Equipment Distributors

MacLean Asphalt Plants
McKinnon-Terry Pile Hoists
McCormick-Deering Tractors
Muffi Foots Road Pavers
Northern Conveyors
Lakewood Finishers
Ohio Tractor Dump Wagons
Templeton Kelly Jacks and Trench Braces
Toledo Torches and Boxes
Trackson Crawler Tractors
Dobie Winches
Lidgerwood Hoists

HAVE YOU CHANGED YOUR LOCAL ADDRESS?

Sometimes in the rush of moving to a new location you fail to send us your new address. And as we are anxious to get your copy of the magazine to you on time do not put-off writing us. Thank you.

**CONTRACTORS AND ENGINEERS
MONTHLY**

470 Fourth Ave. New York

DIRECTORY OF DISTRIBUTORS

CALIFORNIA—DISTRICT OF COLUMBIA

NORRIS K. DAVIS, INC.
400 Seventh St. San Francisco, Calif.

Representing

LE BOI CO.—Gasoline Power Units
MINNEAPOLIS STL. & MACHY. CO.—Twin City Engines
ARCHEER IRON WORKS—Concrete Placing Equipment
CLEVELAND WHEELBARROW CO.—"Red Star" Wheelbarrows
BESSEL SHOVEL CO.—Hand Shovels
DAVIS CO.—Mixers, Hoists, Motor Truck Concrete Transfer Systems, Readymix Concrete Plants

GARFIELD & CO.

Construction Equipment

Hearst Building San Francisco, Calif.

Representing

PLYMOUTH—Gasoline and Diesel Locomotives
LINK-BELT—Shovels, Draglines and Cranes
AUSTIN—Trenchers and Backfillers
BAY CITY—Shovels, Cranes, Draglines and Cranes
CLYDE—Hoists and Derricks
ARCHEER—Concrete Equipment
LEACH—Mixers, Pavers, Saw Rigs
ERIE—Buckets and Aggregometers
ROLLER-BEAR—Rock Crushers

JENISON MACHINERY CO.

58 Fremont St. San Francisco, Calif.

Representing

Barber-Greene Co.
Barrie Read Pumps
Bauer Bins Co.
Cabrico Mfg. Co.
Lamontane Cranes
Wolf Timber Saws
Carter Humidifier Pumps
Chicago Pump Co.
Continental Motors Corp.
The Egin Corporation
Galvin Iron Works & Mfg. Co.
Hercules Corporation
Member: Associated Equipment Distributors

Walter Snow Fighters
McCluskey Torch Co.
Morris Machine Works
J. S. Mundy Htg. Engine Co.
Orton Crane & Shovel Co.
Smith Engr. Works
Starling Pump Works
Berg Finishers
Watt Car & Wheel Co.
Wilson Welder & Metals Co.

KRATZ & McCLELLAND, Inc.

522 Bryant St. San Francisco, Calif.
Northern California Distributors

Rosenow Concrete Machy. Co.—Pavers, Mixers, Towers, Chuting
Novo Engine Co.—Engines, Hoists, Pumps, Lighting Units
Chesapeak Oil Burner Co.—Portable Asphalt Plants, Kettles, Surface Heaters
Greyhound—Contractors Portable Saws
Milwaukee Locomotive Co.—Gasoline Locomotives
Speeder Machy. Corp.—Shovels, Cranes, Draglines
G. H. Williams Co.—Cham Shell & Drag Line Buckets and Heavy-Duty Trailers
Hatzel Steel Form & Iron Co.—Bins, Batchers & Road Forms
Ameti Iron Works—Girder Road Rollers
Union Iron Works, Inc.—Pile Hammers & Foundation Equipment
Autonics, Inc.—Motor Truck Concrete Mixers
Grimm Ditcher Co.—Ditchers and Trench Supporters
Fischer & Hayes Ropes & Steel Co.—Concrete Form Devices
N. P. Nelson Iron Works—Loaders & Conveying Equipment

ELTON T. FAIR CO.

1811 Wazee St. Denver, Colo.

Representing

J. D. Adams Co.
Pioneer Gravel Equip. Mfg. Co.
D-A Lubricant Co., Inc.
Madsen Iron Wks.

JOHN W. FINK INC.
1645 Wazee Street Denver, Colo.

Representing

ROME MFG. CO.—Graders
DUPLEX MFG. CO.—Road Maintenance
SPEEDER MACHY. CO.—Gas Shovels, Cranes, Draglines, Skimmers
HUBER MFG. CO.—Gas Rollers
DAVIS MFG. CO.—Land Levelers

THE HOLMES-TALCOTT CO.
HARTFORD, CONNECTICUT

Representing

LEACHE—Shovels and Cranes
METALWELD—Concrete and Plaster Mixers, Mast Hoists and Saw Rigs
METALWELD-WORTHINGTON—Portable Air Compressors
CLEVELAND—Rock Drills
ERIE—Aggregators, Bins and Buckets
METAFORM—Steel Road Forms
HAISS—Loaders and Conveyors
AUSTIN-WESTERN—Road Machinery
CLYDE Hoists
HIGHWAY—Trailers
SAUERMAN BROS.—Slackline Cableway and Drag Scraper System

Member: Associated Equipment Distributors

Dan O'Gara
INDUSTRIAL & CONSTRUCTION
EQUIPMENT

U. S. National Bank Building, Denver, Colo.

P&H Shovels, Cranes, Draglines, Trench Machines
NORTHERN Portable and Stationary Conveyors
PLYMOUTH Gasoline and Diesel Locomotives
ARCHER Steel Tower & Concrete Distributing Systems
OWEN Clamshell Buckets

OHIO Locomotives Cranes
ERIE Aggregators Plants
MCKIERNAN-TERRY Pile Hammers

GRUENDLER Crushing and Screening Plants
HIGHWAY 2-4-8 Wheel Trailers
PAGE Dragline Buckets

The K. B. NOBLE CO.

C O N N E C T I C U T M A S S A C H U S E T T S
REPRESENTING AMONG OTHERS
Galion Gasoline Rollers, Road Graders, Byers Shovels, Scourifiers, Cranes, etc.
Rex Mixers LeRoi Engines
Hatzel Bins & Batchers Smith Crushers, Lawrence Pumps Sand and Gravel
Sagam Derrick Washing Plants
Sullivan Compressors Owen Buckets
Sauerman Draglines

Member: Associated Equipment Distributors

HARTFORD, CONNECTICUT

Hendrie & Bolthoff Mfg. & Supply Co.

Established 1861
1635 Seventeenth St. Denver, Colo.

Representing

AMERICAN—Contractors Saw Tables
AMERICAN—Hoists and Derricks
BARTER ASPHALT CO.—Roofing and Asphalt Products
BEEBE BROS.—Hand Winches
WONDER—Concrete Mixers
CLIMAX—Gasoline Power Units
GARDINER-DENVER—Pumps, Air Compressors and Drills
GENERAL ELECTRIC—Motors and Appliances
NOVO—Engines and Hoists
ROEBLING—Rope and Wire
SKILSAW CORP.—Skilsaws
UNIVERSAL—Crushers
WYOMING—"Red Edge" Shovels

THE GESNER EQUIPMENT CORP.

254 Park St. New Haven, Conn.

Representing

Jaeger Machine Co.
Northern Conveyor & Mfg. Co.
Domestic Engine & Pump Co.
De Walt Products Co.
Schramm, Inc.
Cleveland Rock Drill Co.
Marion Steam Shovel Co.
Beaumont Mfg. Co.
Universal Road Machinery Co.

H. W. MOORE EQUIPMENT CO.

6th & Acome Streets Denver, Colorado

Representing

BATES Tractors
BUTLER Bins
GALION Graders, etc.
JAEGER Concrete Mixers
GENERAL EXCAVATOR Shovels, Cranes, Etc.
STROUD Elevating Graders
BAKER Maintainers, Plows
ETNYRE Sprinklers & Oilers
LAKEWOOD Concrete Handling Equipment
WEHR One-Man Graders
CHAUSSE Asphalt Heaters

SASGEN Derricks
INTERNATIONAL Tractors
SIDNEY Scrapers and Wheelbarrows
UNIVERSAL Cranes

THEW Shovels
SHRAMM Compressors

CLEVELAND Rock Drills

CEDAR RAPIDS "Pre-Mix" Oil Plants, Crushers, Etc.

TRAILEMOBILE Trailers

HUGHES - KEENAN Iron Mules

Member: Associated Equipment Distributors

Power Equipment & Service Inc.

109 Water Street New Haven, Conn.

CONN. DISTRIBUTORS

COLDWELL Power Mowers
RODERICK LEAN Scrapers
GALION Road Machinery
OLIVER Implements
SARGENT and WALSH Snow Plows
CLETRAC Crawler Tractors
HART-PARR Tractors
MARLO Pumps
DETROIT Street Sweepers
CHICAGO Pneumatic Compressors

HERBERT N. STEINBARGER CO.

Construction Equipment
1840-1846 Wazee St. Denver, Colo.

Distributors

BUCYRUS-ERIE Steam, Gas, Diesel and Electric Shovels
Draglines and Cranes
VULCAN Steam and Gasoline Locomotives
DOMESTIC Engines, Pumps
SAUERMAN Power Scrapers, Cableway Excavators
AUSTIN Trenching Machines, Backfillers
STERLING Hoists, Pumps
KNICKERBOCKER Concrete Mixers
MULTI-FOOTER Paving Mixers
BUFFALO-SPRINGFIELD Road Rollers
DIAMOND Crushing, Screening Plants
RYAN-EDWARDS Road Machinery
BUHL Portable Compressors
HARDSOOG Drills and Pavement Breakers

Member: Associated Equipment Distributors

Hudson Supply & Equipment Co.

7th & T Sts., NE Washington, D. C.

Representing

HELTEEL STEEL FORM & IRON CO.—Road Forms, Curb and Gutter Forms, Bins, Batchers
M. P. NELSON IRON WORKS, INC.—Loaders
CONCRETE SURFACING MACHINERY CO.—"Berg" Concrete Surfaces
CHAIN BELT CO.—Mixers, Hoists, Pumps
SASGEN DERRICK CO.—Derricks, Winches
NOVO ENGINE CO.—Hoists, Pumps, Engines
NATIONAL BRAKE & ELECTRIC CO.—Air Compressors

Member: Associated Equipment Distributors

THE HENRY H. MEYER CO.

658 Munsey Bldg. Washington, D. C.
110 S. Howard St., Baltimore, Md.

Representing

Austin Machinery Co. Harrington Co.
Blaw-Knox Co. Lambert Hoisting Engine Co.
Boston & Lockport Block Co. A. Lessken & Sons Rope Co.
Brookville Locomotive Co. Pulsometer Steam Pump Co.
Byers Machine Co. Flansome Concrete Mach. Co.
Chausse Oil Burner Co. Richmond Screw Anchor Co.
Connery & Co., Inc. Sterling Wheelbarrow Co.
Domestic Engine & Pump Co. Templeton-Kenly Co., Ltd.
E. I. Du Pont de Nemours & Co. Toledo Pressed Steel Co.
Dobie Fdy. & Machine Co. Union Iron Works
Duff Mfg. Co. Universal Road Machy. Co.
Duff Mfg. Co.

JULIEN P. BENJAMIN, Inc.

21 N. Ocean St. Jacksonville, Fla.

Representing

McKernan-Terry Corp. Barber-Greene Co.
Barber-Greene Co. Aerol Burner Co.
Aerol Burner Co. Sauerhoff Bros., Inc.
Link Belt Co.
Heltzel Steel Form & Iron Co. Standard Conveyor Co.
Dixoyl, Incorporated National Colorotype Co.
Huber Rollers Climax Engineering Co.
National Hoisting Engines Bay City Truck Cranes
Owens Buckets Rosco Distributors
Ryan & Edwards Graders Schramm, Inc.

FARQUHAR MACHINERY CO.

Mill Supplies and Machinery
720 W. Bay Street Jacksonville, Fla.

Representing

AMERICAN "BOSS" Concrete Mixers
ARCHER Concrete Tower Equipment
CARBIC Flame Lights, Welding Equipment
CRESCENT Saw Tables and Woodworkers
FARQUHAR Wheelbarrows, Concrete Carts
GOULD'S-MYERS Chains, Sprockets, Drives
JACKSON Gasoline Engines
LINK-BELT Hoists, Single and Double Drum
NOVO Power Diaphragm & Road Pumps
NOVO Power Diaphragm & Road Pumps
SASGEN Derrick Equipment
SILVERSTRAND Wire Rope and Accessories
TOLEDO Steel Torch Lights
STRUCTURAL STEEL Plain and Fabricated

M. D. MOODY

ACL No. 2—Sect. 1, Riverside Viaduct
Jacksonville, Florida

Representing

J. D. Adams & Co. Chas. Hyss Co.
American Casting Co. Littleford Brothers
American Mfg. Co. Lakewood Engineering Co.
American Tar Products Co. Mead-Morrison Mfg. Co.
Buffalo-Springfield Roller Co. Rawls Mfg. Co.
Cyclone Fence Co. Page Engineering Co.
The Elgin Corporation Freeman Mfg. Co.
E. D. Elmyre & Co. Domestic Engine & Pump Co.
De Walt Products Co.

CONTRACTORS EQUIPMENT CO.

2150 N. W. 1st Court Miami, Fla.

Representing

INGERSOLL-RAND Compressors
REX Mixers, Pavers, Chain
BLAW-KNOX Steel Forms, Batchers
JONES-SUPERIOR Super Woodworkers
LANSING Hoists
BARNES Pumps
ORD Concrete Road Finishers
STREET BROS. Hoist and Derrick Fittings
SYNTRON Electric Hammers
NORTHERN Conveyors
LE ROI Engines
ESSICK Plaster Mixers
Miscellaneous Contractors' Supplies

LLEWELLYN MACHINERY CORP.
MIAMI FLORIDA

Representing

American Saw Mill Machy. Co. Independent Pneu. Tool Co.
Archer Iron Works Jaeger Machine Co.
Atlas Imperial Diesel Eng. Co. Jeffrey Mfg. Co.
Austin-Western Rd. Machy. Co. Wm. H. Keller, Inc.
Barber-Greene Co. Mathews Conveyor Co.
Bay City Fdy. & Mach. Co. Metal Forms Corp.
Blystone Mfg. Co. Northwest Eng. Co.
Chicago Pneumatic Tool Co. Page Engineering Co.
Cleveland Tractor Co. Bay City Fdy. & Mach. Co.
Consolidated Cone Machy. Co. Oliver Farm Equip. Co.
Denver Rock Drill Mfg. Co. Rochester Can Co.
Electric Welding Co. Rumsey Pump Co.
Engberg's Electrical and Saenger Derrick Co.
Mechanical Works Schramm, Inc.
Erie Steel Constr. Co. Worthington Pump &
Foote Co.—Pavers Machinery Co.

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CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Ave. New York

I. E. SCHILLING CO.

P. O. Box 1454 Miami, Fla.

Representing

Acme Road Machy. Co. National Brake & Electric Co.
Allis-Chalmers Mfg. Co. National Equip. Corp.
Butler Bin Div. Persons Co.
Clyde Iron Works Patent Scaffolding Co.
Domestic Engine & Pump Co. Riddell Co., W. A.
Good Roads Machinery Co. Ryan Mfg. Corp.
Harrington Co. Ideal Power Mower Co.
Indy Mfg. Co. Saenger Derrick Co.
Koehring Co. Sterling Wheelbarrow Co.
Lakewood Eng. Co. Toledo Pressed Steel Co.
MacWhitby Co. Wyoming Shovel Works
McLanahan-Stone Machine Yale & Towne Mfg. Co.

YANCEY TRACTOR COMPANY

109-115 Booker Ave. Albany, Ga.

Representing

"CATERPILLAR" Tractors BARBER-GREENE Loader
and Road Machinery Excavators and Conveyors
ATHEN Truss Wheels BLAW-KNOX Tarstabil
BAKER-MANLY Wheelers Steel Forms, Bins and Hops
WATSON Dump Wagons Buckets, etc.
KILLEFER Road Rippers HVASS Ploughs, Swings
Rotary Scrapers HERCULES & LE ROI
"RED EDGE" Shovels, Picks INGERSOLL-RAND Com
"RED STAR" Carts and Pressers
Wheelbarrows EASTON Cars and Track
MUNDY Hoppers ORI. Conc. Road Surface
BARNES Pumps McKEERNAN-TERRY Pl
BUFFALO-SPRINGFIELD Rollers Hammer
LITTLEFORD BROS. Asphalt P & H. Shovels, Cranes
Heater LA PLANTE-CHOATE Dump Wagons

R. S. ARMSTRONG & BRO. CO.

676 Marietta St. Atlanta, Ga.

BEEBE Hand Hoists JAEGER Concrete Mixers
BUTLER Bins LE ROI Engines
CARBIC Lights LAKEWOOD Road Mach
CHICAGO PNEUMATIC Handling Equipment
Air Compressors LIDGERWOOD Hoists
ALLIS-CHALMERS OWEN Buckets
"Monarch" Tractors SASEN Derricks and
CONTINENTAL Motors Winches
DOMESTIC Pumps STEUBENBERG Buckets
EDWARDS Shears SKILSWAL Portable El. Saw
GALION Road Machinery UDDEHOLM Drill Steel
GENERAL ELECTRIC WATERLOO Bar Ends
Motors WORTHINGTON Pumps
HERCULES Motors ASME Shovels, Scoops
HOTCHKISS Steel Forms EMERSON Pumps, Valves
TRACKSON Crawlers JONES-SUPERIOR Saw Rigs
JONES-SUPERIOR Saw Rigs and Woodworkers
Member: Associated Equipment Distributors

D. E. FISHBACK

ORLANDO FLORIDA

Representing

Fairbanks-Morse & Co., Oil Engines, Pumping Machinery
Electric Motors, Home Light and Water Plants
Jaeger Machine Co., Concrete Mixers, Road and Trench
Pumps, Hoists, Etc.
Cincinnati Rubber Co., Dredging Sleeves, Suction and Dis
charge Hose
American Saw Mill Mach. Co., Portable Woodworkers,
Saw Benches, etc.
Gould's Pumps Inc., Power, Diaphragm and Hand Pumps
Cement Block Machine Co., "National" Concrete Block
Machines
Chicago Pneumatic Tool Co., Portable and Stationary Air
Compressors, Lift Pumps, Pipe, Valves and Fittings
STOCK CARRIED IN ORLANDO

McDONALD TRACTOR EQUIP. CO.

2303 N. Orange Ave. Orlando, Fla.

Representing

Caterpillar Tractor Co.
"Caterpillar" Graders
Athey Truss Wheel Co.
Barnes Manufacturing Co.
Blaw-Knox Company
P & H Cranes
LaPlante-Choate Mfg. Co.
Detroit Harvester Co.
Chain Belt Co.
Fate-Roof-Heath Co.
Fuller & Johnson Mfg. Co.
Killefer Manufacturing Corp.
Le Roi Company
Goulds Pumps, Inc.
Stover Engines
Century Motors
Member: Associated Equipment Distributors

BLALOCK MACHINERY &
EQUIPMENT CO.Road Building—Rock Crushing
Earth Moving Equipment

389 Whitehall St., S.W. Atlanta, Ga.

Representing

Austin-Western Road Machinery Co.
Cleveland Tractor Co.

W. C. CAYE & CO.

Contractors Equipment and
Construction Machinery
158-160 Walker St. Atlanta, Ga.

Representing

KOEHRING—Pavers, Mixers, Cranes, Shovels, Dumper
and Subsidiary Plants
T. L. SMITH—Pavers, Tilting and Non-tilting Mixers
INSLEY—Gasoline Cranes, Shovels, Mast Hoists, Casting
Plants and Steel Derricks
PARSONS—Ditchers and Backfillers
C. H. E.—Saw Rigs, Gasoline Hoists, Mortar Mixers and
Pumps
JOHNSON—Material Bins and Batchers
SULLIVAN—Air Compressors and Tools
HUBER—Road Rollers
CLYDE—Hoists and Derricks
Member: Associated Equipment Distributors

WE WOULD LIKE TO
HAVE YOU HELP US

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Avenue New York

DIRECTORY OF DISTRIBUTORS

GEORGIA—ILLINOIS

Tractor & Machinery Co., Inc.
351 Whitehall Street, S. W.
ATLANTA
GEORGIA

Representing

"Champion" Rock Crushers, and Asphalt Distributors
"Cleveland" Rock Drills
"Northwest" Cranes, Shovels and Draglines
"Ryan" Road Graders
"Schramm" Air Compressors
"Erie" Aggrometer Plants

YANCEY BROTHERS, Inc.
634 Whitehall St., SW. Atlanta, Ga.

"CATERPILLAR" Tractors
"CATERPILLAR" Graders
BAKER-MANEY Wheelers
Wagon Graders
KILLEFER Road Rollers
IOWA Crushers, Plant
REX Pavers and Mixers
REX Pavers and Saw Rigs
BARRIER-GREENE Loaders
BUFFALO-SPRINGFIELD
Road Rollers
BLAW-KNOX Buckets, Bins
P & H Scavels, Cranes
ORD Road Surfaces
MUNDY Hoists
LA-PLANT CHOATE Snow
Plows
Member: Associated Equipment Distributors

INGERSOLL-RAND Air
Compressors

CROWE Electric Saws

AMERICAN Towers

LITTLEFORD Asph. Tools

LE ROI Gas Engines

WAUKESHA Gas Engines

SMITH Gravel Plants

RED STAR Wheelbarrows

CYCLONE Guard Rail

EASTON Dump Cars

RED EDGE Shovels

WIARD Plows and Scavels

HVASS Asphalt Distributors,

Trailers, Plasters, Sweepers

McKERNAN-TERRY File
Hammers

Member: Associated Equipment Distributors

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CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Ave. New York

Hamilton Tractor & Equipment Co.
411-419 North Illinois Carbondale, Ill.

Representing

"CATERPILLAR" Tractors
"CATERPILLAR" Graders
"CATERPILLAR" Combines
LA-PLANT-CHOATE Wagons
LA-PLANT-CHOATE Bulldozers
DORSEY Stump Pullers
"TRULAY" Cable
TOWERS and SULLIVAN Agriculture Implements
ROCK ISLAND Agriculture Implements
WILLAMETTE-ERSTED Hoists and Winches
KILLEFER Contracting Tools and Agriculture Implements

PAUL COCHRAN EQUIPMENT CO.
310 South Michigan Ave., Chicago, Ill.

Representing

Novo Engine Co.
Northern Conveyor & Mfg. Co.
The Knickerbocker Co.
Independent & Mercer Rubber Co.
Richmond Screw & Anchor Co.
American Steel & Wire Co.
D-A Lubricant Co.
Great Lakes Supply Co.
G. H. Williams Co.

The G. E. Hillsman Company
Contractors' Equipment
228 No. LaSalle St. Chicago, Ill.
Branch Office Indianapolis, Ind.

KOEHRING—Paving Mixers, Gasoline Cranes, Shovels and Draglines, Subgraders, Dumpers
SMITH—Paving Mixers, Tilting and Non-Tilting Mixers
INSLEY—Gasoline Shovels, Cranes and Draglines, Mast Hoists, Chuting Plants and Derricks, Shoulder Finishing Machines
PARSONS—Ditchers and Backfillers
C. H. & E.—Saw Rigs, Gasoline Hoists, Mortar Mixers and Pumps
KWIK-MIX—Concrete Mixers, Mortar Mixers, Mud Jacks
BLAW-KNOX—Road, Sidewalk, Curb and Gutter Forms, Steel Bins, Batchers, Clamshell Buckets, Ord Finishers, Etc.
ALLIS-CHALMERS MFG. CO.—Monarch Tractors
METALWELD—Air Compressors and Tools
STERLING Wheelbarrows and Concrete Carts
Member: Associated Equipment Distributors

HOUCK EQUIPMENT CO.
Sales Engineers
176 W. Adams St. Chicago, Ill.

Representing

OSGOOD CO.—Shovels, Cranes, Draglines
DAKE ENGINE CO.—Hoists, Steam, Gas and Electric
MUSKEGON PUMP & GENERATOR CO.—Gas Driven Pump and Generator Units
REPUBLIC IRON WORKS—Concrete Mixer, All Sizes
DIAMOND IRON WORKS—Crushing Equipment
SCOTT ENGINEERING CO.—Tractor with Crane and Shovel Attachments

NORTHERN CONVEYOR CO.—Conveyors, etc.

HERCULES MOTORS CORP.—Gas Engines

Also Good Used Equipment—All Kinds
Send for List**L. Z. HOWELL**

Construction Equipment

300 W. Pershing Rd. Chicago, Ill.

Phone: Boul. 8100

Representing

LINK-BELT CO.

Crawler Type Shovels, Draglines, Clamshells, Trench Hoes, 1/2 to 2 Cubic Yards

KOHLER CO.
Automatic Electric Plants**R. H. HYLAND COMPANY**

221-225 W. Huron St. Chicago, Ill.

Exclusive Representatives
LEACH Concrete Mixers and Mast Hoist Plants
McKERNAN-TERRY Pile Hammers
WYOMING "Red Edge" Shovels
WILLIAMS Clam Shell Buckets
NATIONAL Hoisting Engines
BARNES Pumping Outfits
INGERSOLL-RAND Air Compressors and Tools
M & M Form Clamps
JONES SUPERIOR Saw Rigs
ATLAS Adjustable Shores
HELTZEL Bins
NOEDBERG Track Shifters
RAWLS Mowing Machines
VERONA Track Tools
MEYER-HECHT Adjustable Shores
Member: Associated Equipment Distributors

LOOK THIS DIRECTORY OVER CAREFULLY

If you find any errors while checking over this directory will you please advise us at once, because it is our desire to keep it accurate and up-to-date at all times.

CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Ave. New York

W. B. LOUER COMPANY
Construction Equipment

431-5 So. Jefferson St. Chicago, Ill.

ALLSTEEL Tractor Booms & Hoists

LA PLANT-CHOATE Bulldozers, Scrapers, Snow Plows, Dump Wagons & Trailers

MIAMI Scrapers & Trailers

RAWLS Mowers

SARGENT Snow Plows

SHAW Land Levelers

WAUSAU Snow Plows

WILLAMETTE-ERSTED Scrapers, Tractor Hoists & Cranes

W-K-M Tractor Booms

Member: Associated Equipment Distributors

G. F. LOWE COMPANY
612 No. Michigan Ave. Chicago, Ill.

Representing

MULTI-FOOTE Pavers
HAISS Loaders, Buckets, Excavators
JOHNSON Bins, Batchers
BAY CITY Shovels, Cranes and Draglines
HUG Trucks
MILWAUKEE Locomotives
ERIE Road Rollers
SAUERMAN Cableways, Power Scrapers
Member: Associated Equipment Distributors

JAEGER Mixers, Pumps, Hoists, etc.

LAKEWOOD Towers, Forma, Subgraders, Spouting Equipment, etc.

NATIONAL Compactors

SEALTIGHT Expansion Joints

UNION Pile Hammers, Buckets, Pumps

CLEVELAND ROCK DRILL CO.

MIDWEST TRACTOR & EQUIP. CO.
2701 So. Wabash Ave. Chicago, Ill.

Representing

Cletrac Crawler Tractors
Coleman Four Wheel Drive Trucks
Stroud Elevating Graders
Bully Bulldozers
Rotary Snow Plows
Sargent Snow Plows
Handy Sandy Spreaders

SUPERIOR CONSTR. EQUIP. CO.
Construction Equipment

1850 South Kostner Ave., Chicago, Ill.

Distributors

LoRo Engine Co.
Chain Belt Co.
Butter Bin Co.
Chicago Automatic Conveyor Co.
The Huber Mfg. Co.
Sullivan Machinery Co.

A Complete Line of Construction Tools and Equipment Carried in Chicago

TELEPHONE: CRAWFORD 6200

Member: Associated Equipment Distributors

THE TRACTOR & EQUIPMENT CO.
551 W. Van Buren St. Chicago, Ill.

Representing

BROOKVILLE—Locomotives
DAVEY—Air Compressors
DETROIT HARVESTER—Mowers
ERSTED—Truck Cranes and Hoists
HUGHES-KEEAN—Iron Mules
MCCORMICK-DEERING—Tractors
NELSON—Loaders
NORTHERN—Conveyors
SARGENT—Snow Plows
TRACKSON—Tractor Equipment
UNIVERSAL—Power Shovels
WAECO—Graders and Scoops

Western Contractors Supply Co.

Everything for the Contractor

14 No. Clinton St. Chicago, Ill.

Representing

DOMESTIC—Pumps, Hoists and Engines

RANSOME—Mixers and Pavers

RED STAR—Wheelbarrows and Shores

INGERSOLL-RAND—Compressors and Tools

WIARD—Contractors Plows

Repairs for Climax, Twin City
Waukesha and Le Roi Engines

Member: Associated Equipment Distributors

A. E. HUDSON COMPANY

311 Franklin St. Peoria, Ill.

Representing

ALLIS-CHALMERS MFG. CO.—Monarch and
United Tractors

BAKER MFG. CO.—Road Tools

DETROIT HARVESTER CO.—Mowers

MUSKOGEE IRON WKS.—Maintainers

DAVENPORT LOCOMOTIVE & MFG. CORP.—

"Cat" Wagons

FOUR WHEEL DRIVE—Trucks

F. W. D. TRUCKS

STROUD—Elevating Graders

TRACKSON—Crawlers, Shovels and Hoists

NOVO—Pumps, Hoists and Engines

GALION—Graders

PEORIA TRACTOR & EQUIP. CO.

400 Franklin St. Thru to 419 Liberty St.
Peoria Illinois

Telephone 6177

"CATERPILLAR" Tractors, Road Machinery, Combines
LA PLANT-CHOATE Dump Wagons, Scrapers, Bulldozers,
Snow Plows, etc.

ATHY Truss Wheel Hydraulic, Dump Wagons

EUCLID Track Wheel Dump Wagons, etc.

MIAMI Scrapers and Trailers

DROTT Bulldozers, Scrappers, Backfillers

KILLEFER Road and Agricultural Tools

SHAW Land Levelers

DAVEY Compressors

WILLAMETTE-ERSTED Hoists

BALL Wagon Graders

HIGHWAY TRAILER Scrapers, Earthboring Machines

ATECO Bulldozers, Dismovers, Tamers

DAY Jaw Crushers

Standard Road Equipment Co., Inc.

2724 Auburn St. Rockford, Ill.

Representing

ALLIS-CHALMERS Monarch Tractors

ALLIS-CHALMERS Ind "U" Strail Tractors

GALION Road Machinery

BAKER Tractor Equipment

PIONEER Gravel Equipment

DAVENPORT Cat-Tread Wagons

STROUD Elevating Graders

TRACKSON Tractor Equipment

DETROIT Mowers and Sweepers

CHICAGO Pneumatic Air Compressors

SWORDS BROS. CO.

627-635 7th St. Rockford, Ill.

Representing

JAEGER mixers, pumps and hoists

LAKEWOOD towers and mast plants

INGERSOLL-RAND compressors and tools

AMERICAN-GOPHER shovels and cranes

A. LESCHEN & SONS wire rope

UNIVERSAL and SYMONS form clamps

OWEN clamshell buckets

JONES SUPERIOR saw rigs

LEROI and WAUKESHA engines

SASGEN derricks

HAUCK heaters

Wheelbarrows—Shovels—Tarpaulins

Hose—Paint—Tools—Belting

New and Rebuilt Power Equipment

"Swords Service Satisfies—Try It"

BOWMAN-RALSTON TRACTOR & EQUIP. CO.

401 E. Florida St. Evansville, Ind.

Representing

"Caterpillar" Tractors

"Caterpillar" Road Machinery

"Caterpillar" Combine Harvesters

Baker Mfg. Co. Speeder Machy. Corp.
Killefer Mfg. Co. Euclid Scrapers
LaPlant-Choate Mfg. Co. Euclid Track-Wheel
Allsteel Prod. Mfg. Corp. Wagons
Williamette-Ersted Hoists Euclid Bulldozers
Davey Compressors Athey Truss Wheels
Detroit Mowers, Street Sweepers

THE G. E. HILLSMAN COMPANY

21-23 So. Senate Ave. Indianapolis, Ind.

Representing

KOEHRING—Paving Mixers, Gasoline Cranes, Shovels and

Draglines, Subgraders

SMITH—Paving Mixers, Tilting and Non-Tilting Mixers

INSLEY—Gasoline Shovels, Cranes and Draglines, Mast

Hoists, Chuting Plants and Derricks

PARSONS—Ditchers and Backfillers

C. H. & E.—Saw Rigs, Gasoline Hoists, Mixers, Pumps

MARLO—Pumps MUNDY—Hoisting Engines

BLAW-KNOX—Road, Sidewalk, Curb and Gutter Forms

Steel Bins, Batchers, Clamshell Buckets, Etc.

A. W. FRENCH—"ORD" Finishing Machines

METALWELD—Air Compressors and Tools

STERLING—Wheelbarrows and Concrete Carts

ALLIS-CHALMERS—Monarch Tractors

AUSTIN-WESTERN—Dirt moving equipment, Graders

HUG CO.—Trucks, Subgraders, Templates

Member: Associated Equipment Distributors

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CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Ave. New York

MOELLERING SUPPLY COMPANY

Fort Wayne Indiana

Representing

Jaeger Machine Co.

Northern Conveyor & Mfg. Co.

Schramm, Inc.

Sasgen Derrick Co.

American Steel Scraper Co.

Skilsaw, Inc.

Homelite Corp.

PERRY & WILSON EQUIP. CO., INC.

345 E. South St. Indianapolis, Ind.

Representing

CATERPILLAR TRACTOR CO.—"Caterpillar" Tractor

"Caterpillar" Graders and Road Machinery, "Caterpillar"

Combined Harvesters

THE BAKER MFG. CO.—Mancy Scrapers

KILLEFER MFG. CORP.—Revolving Scrapers, Road Rippers

LA PLANT-CHOATE MFG. CO.—Track-type Wagons

Three-way and Bottom Dump Wagons, Bulldozers, Backfillers and Snow Plows

GEO. HAISSE MFG. CO.—Gravel Loaders and Excavators

DAVEY COMPRESSOR CO.—Air Cooled Air Compressors

HARNISCHFEGER SALES CORP.—P. & H. Shovels and

Draglines

ATECO—Dismovers and Scrappers

EUCLID ROAD MACHY. CO.—Track Type Wagons, Bulldozers, Tamping Rollers and Rotary Scrapers

S. & L. EQUIPMENT COMPANY

Fort Wayne, Indiana

Representing

Thew Shovel Co. Concrete Surf. Machy. Co.,

"Berg"

Universal Crane Co. Diester Machine Co.

Page Engineering Co. Sidney Steel Scraper Co.

Owen Bucket Co. Iowa Mfg. Co.

Novo Engine Co. Cincinnati Rubber Co.

The Burch Corp. E. D. Etnyre & Co., Inc.

Ross Snow Plow York Modern Corp.

Schramm, Inc. Cyclone Fence Co.

W. R. Meadows, Inc. Gledhill Road Machy. Co.

Geo. Haiss Mfg. Co.

Ryan Graders

Stroud Elevating Graders

National Steel Fabric Co.

Kelman Steel Co.

Deister Machine Co.

Cleveland Tractor Co.

Bay City Truck Cranes

G. H. Williams Co.

Lakewood Engineering Co.

C. S. Johnson Co.

Geo. Haiss Mfg. Co.

Barney Mfg. Co.

W. A. Riddell Co.

Kelman Steel Co.

Deister Machine Co.

Clyde—Gasoline and Steam Hoists, Derricks

JAEGER—Mixers, Pumps

A. W. FRENCH—Ord. Concrete Road Finishers

SULLIVAN—Air Compressors, Tools

SPEEDER—Cranes, Shovels, Draglines

TRACKSON—Crawlers, Shovels and Bulldozers

McCORMICK-DEERING—Industrial Tractors

Member: Associated Equipment Distributors

STOCKBERGER EQUIPMENT CO.

Contractors' Equipment

1211-1212 1st & Tri-State Bldg., Ft. Wayne, Ind.

Representing

Northwest Engineering Co. Cleveland Tractor Co.

Foote Co.—Pavers Bay City Truck Cranes

Lakewood Engineering Co. G. H. Williams Co.

C. S. Johnson Co. Page Engineering Co.

Geo. Haiss Mfg. Co. Knickerbocker Co.

Barney Mfg. Co. Burch Mfg. Co.

Ryan Graders W. A. Riddell Co.

Stroud Elevating Graders Deister Machine Co.

National Steel Fabric Co. Kelman Steel Co.

Kelman Steel Co.

Deister Machine Co.

Clyde—Gasoline and Steam Hoists, Derricks

JAEGER—Mixers, Pumps

A. W. FRENCH—Ord. Concrete Road Finishers

SULLIVAN—Air Compressors, Tools

SPEEDER—Cranes, Shovels, Draglines

TRACKSON—Crawlers, Shovels and Bulldozers

McCORMICK-DEERING—Industrial Tractors

Member: Associated Equipment Distributors

GIERKE-ROBINSON CO.

4th & Ripley Sts. Davenport, Iowa

Representing

BUCKRUS-ERIE—Cranes, Shovels and Draglines

BLAW-KNOX—Steel Road, Curb and Gutter Forms, Bins

Batchers, Clamshell Buckets, Truck Turntables, etc.

CHAIN BELT—Mixers, Pavers, Pumps, Saw Rigs, Conveyors, Elevators

CLYDE—Gasoline and Steam Hoists, Derricks

JAEGER—Mixers, Pumps

A. W. FRENCH—Ord. Concrete Road Finishers

SULLIVAN—Air Compressors, Tools

SPEEDER—Cranes, Shovels, Draglines

TRACKSON—Crawlers, Shovels and Bulldozers

McCORMICK-DEERING—Industrial Tractors

Member: Associated Equipment Distributors

HERMAN M. BROWN CO.

Des Moines, Ia. Omaha, Nebr.

Representing

KOEHRING Pavers, Mixers, Cranes, Shovels, Draglines, Dumper, BLAW-KNOX Road Forma, Bins, Buckets, Turntables, Weighing Devices, INSLEY Shovels, Cranes, Draglines, Mast Hoist Plants, C.H. & E. Pumps, Hoists, Saw Rigs, SMITH Mixers, WALTER Snow Fighters, HUGHES-KEENAN Iron Mules, PARSONS Trenchers and Backfillers, B. & G. Lubricants, KWIK-MIX Tub Mixers, HUBER Motor Rollers, NORTHERN Conveyors, TRACKSON Crawler Wagons, CLETRAC Tractors, WEHR Maintainers.

Member: Associated Equipment Distributors

Brandeis Machinery & Supply Co.

201 Warnock St. Louisville, Ky.

Representing

J. D. Adams & Co. Ingersoll-Rand Co. Ingalls Mig. Co. Barber-Green Co. LoRo Co. Boller Manufacturing Co. Rogers Bros. Corp. A. L. Lechner & Sons Rope Co. Blaw-Knox Co. E. I. Du Pont de Nemours McKleran-Terry Corp. Cameron Steam Pump Works Plymouth Locomotive Wks. Homelite Corp. Saenger Derrick Co. Fuller & Johnson Mfg. Co. T. L. Smith Co. Smith Engineering Works Buysrus-Erie Co. Sterling Wheelbarrow Co. Clev. Iron Works Rex-Watson Corp. Western Wheeled Scraper Co. Dizoyl, Inc. Littleford Bros. Member: Associated Equipment Distributors

EASTON TRACTOR AND EQUIPMENT COMPANY

2025 Lower Third St., Alexandria, La.

Representing

CATERPILLAR TRACTOR CO.—"Caterpillar" Tractors and Road Machinery, SPEEDER MACHINERY CO. B.—Cranes, Shovels and Draglines, ATLAS SCRAPER CO.—Rotary Scrapers, WILLAMETTE-ERSTED CO.—Tractor Hoists.

Also

A complete line of Tractor Farming Implements and Tractor Appliances

DUKEHART MACHINERY COMPANY

106-8-10 W. Second St., Des Moines, Ia.

Representing

ALLIS-CHALMERS "Monarch" Tractors, ALLIS-CHALMERS Model U, Ind."U"trial Tractors, GALION Graders and Motor Patrols, STRBOUD Elevating Graders, ST. LOUIS Red Dump Wagons, DAVENPORT Cat. Wagons, CENTURY & SHAWNEE Full-Type Maintainers, PERRY Scrapers, WABCO Scops, SNOW PLOWS, M W Lubricant, NORTHWEST Shovels and Draglines.

SID SCHULTZE

427 Intersouthern Bldg., Louisville, Ky.

Representing

WOLVERINE TUBE CO.—Seamless Copper-Brass—Aluminum, MILWAUKEE AIR POWER PUMP CO.—Fresh running water from well, SCHULTZE MFG. CO.—Belgian Metal Coatings—500 and 1000-o-Heat-Proof Grey Stack Paint, NORTHERN INDIANA BRASS MFG. CO.—Brass—Copper—Valves and Fittings, HEIL CO.—Hydraulic Hoists, Steel Bodies, STANDARD VEHICLE CO.—Buggies (Horse Drawn) Pony Carts, Harness

FLETCHER EQUIP. CO., INC.

309 Magazine St. New Orleans, La.

Representing

ARCHER Towers and Chuting Equipment, BARBER-GREENE Loaders, Conveyors, Ditchers, BAY CITY Truck Cranes, BUTLER Bins, Batchers, CLYDE Hoisting Engines and Derricks, FREEMAN Turntables, LE ROI Gas Engines, LINK-BELT Draglines, Cranes and Shovels, M & M Form Clamps, McLEOD Asph. Heaters, Member: Associated Equipment Distributors

Representing

OWEN Clamshell Buckets, OMAHA Dragline Buckets, REX Mixers, Pavers, Pumps and Saw Rigs, SAUERMAN Cableway Excavators, STERLING Wheelbarrows and Carts, SULLIVAN Air Tools and Compressors, SIMPLEX Trench Braces and Jacks, TOLEDO Torches, WOOD Molybdenum Steel Shovels, Member: Associated Equipment Distributors

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CONTRACTORS AND ENGINEERS

MONTHLY

470 Fourth Ave. New York

ROY C. WHAYNE SUPPLY CO.

8th & Main Sts. Louisville, Ky.

"CATERPILLAR" Tractors, "CATERPILLAR" Road Machinery, JAEGER Concrete Mixers, HELTZEL Steel Forms, BARNES Pumps, DAVEY Air Cooled Compressors, HARDSCOG Drill, CHICAGO AUTOMATIC Conveyors, NORTHWEST Shovels, Cranes and Draglines, EUCLID Scrapers, Wagons, ATHEY Wagons, LaPLANT-CHOATE Bulldozers, Member: Associated Equipment Distributors

EQUITABLE EQUIPMENT CO. Inc.

410 Camp St. New Orleans, La.

Representing

ACME Road Graders, Rollers, BROWNING Cranes, BURY Air Compressors, AUSTIN Trenching Machines, BOX Cranes and Hoists, BUDA Diesel Engines, CLIMAX Engines, DEAN BROS. Pumps, DEAN HILL Centrifugal Pumps, Turbines, ERIE Aggregators, Bins, FLORY Hoists, GENERAL ELECTRIC Arc Welders, Motors, INGERSOLL-RAND Air Compressors, Tools, KOPPEL Industrial Cars, LAKEWOOD Mixers, Towers, MERRELL Pipe Machines, MORRIS Dredges, Pumps, NOVO Engines, Hoists, Pumps, NAGLE Boilers and Engines, PACIFIC Deep Well Pumps, PLYMOUTH Locomotives, STEPHENS-ADAMSON Conveyors, Etc., SILENT Hoists and Cranes, SWABY Centrifugal Pumps, WEBER Insulating Cement, WEIR-KILBY Frogs, Switches, Welded Tanks, Pipe, Etc.

WILSON MACHY. & SUPPLY CO., Inc.

Contractors' Equipment & Supplies

139-51 North Mill St. Lexington, Ky.

Distributors for

Allis-Chalmers Mfg. Co. Ingersoll-Rand Co. Austin-Western Road Machinery Co. Domestic Engine & Pump Co. Lakewood Engineering Co. The Shovel Co. Construction Machinery Co. American Steel & Wire Co. Austin Machinery Corp. Butler Bin Co. Foote Company, Inc. Atlas Powder Co. "The Contractors' Supply House in Central Ky."

Joe C. Tucker

Morganfield Kentucky

Representing

J. D. Adams Co. Cleveland Tractor Co. Western Wheeler Scraper Co. Harnischfeger Corporation, Lakewood Engineering Co. A. B. Farquhar, Ltd. Chain Belt Co. Link-Belt Co. Sullivan Machy. Co. Reliance Crushers

Louisiana Road Machinery Co., Inc.

1111 Julia Street New Orleans, La.

Representing

GALION IRON WKS. & MFG. CO.—Graders, Rollers, Motor Patrols, etc., CLEVELAND TRACTOR CO.—Tractors, ELGIN CORP.—Street Sweepers & Eductors, EAGLE TRUCK BODY & MFG. CORP.—Dump Wagons, UNIVERSAL CRUSHER CO.—Rock Crushers, STROUD ROAD MACHINERY CO.—Elevating Graders

THOMAS L. BARRET

Contractors' Equipment

LOUISVILLE, KENTUCKY

WILLIAMS Clamp Shell and Drag Line Buckets, WILLIAMS "Arch-Girder" Trailers, HAISL Loaders and Material Handling Equipment, ARMSTRONG Blast Hole Drills, UNION Hammers & Concrete Buckets, HUG Trucks, Turntables and Subgraders, MUNDY Hoisting Engines, VULCAN Locomotives, METAFORM Road Rails, etc., "CAMEL" Automatic Tractor Dump Wagon, KENNEDY Gearless Crushers, CORRUGATED Bar and Mesh Reinforcement, BARRET Asphalt Expansion Joint.

HENRY A. PETTER SUPPLY CO.

Paducah Kentucky

Alenia Equipment Northwest Shovels, Cranes, American Wire Rope, Mesh Novo Pumps and Hoists, Archer Tower Equip. Oxweed Apparatus, Bates Bar Ties, Black & Decker Tools, Chain Belt (Rex) Mixers, D. A. Lubricants, DuPont Explosives, Dobbie Derricks, Farnsbar Engines, Boilers, Gulf States Reinforcing Steel, Hauck Hesters and Thawers, Johnson Bins and Hoppers, Lidgewood Hoisting Machy., Midwest Locomotive, Link-Belt Portable Conveyors, LeRoi Gas Engines, Member: Associated Equipment Distributors

OLE K. OLSEN

325 N. Cortez St. New Orleans

Representing

Ranemo Concrete Machinery Co. Wyoming Shovel Works, McKleran-Terry Corp. Erie Bins & Batchers, American Cement Mach. Co. Patent Scaffolding Co., American Saw Mill Machinery Co. Universal Form Clamp Co., Atkin Engineering Co., Blystone Mfg. Co. LeRoi Co. Cleveland Wheelbarrow Co. H. W. Ross Co. American Steel & Wire Co.

Member: Associated Equipment Distributors

SOUTHERN STATES EQUIP. CO., Inc.
 1510-1530 Tchoupitoulas St. NEW ORLEANS
Representing

P & H—Shovels, Cranes and Draglines
 BLAW-KNOX—Bins, Batchers, Road Forms, Buckets
 OED—Concrete Finishing Machines
 FOOTE—Paving Mixers
 JAEGER—Concrete Mixers
 TELSMITH—Sand and Gravel Plants
 DOMESTIC—Pumps, Engines
 ORR & SEMBOWER—Hoisting Engines
 LAKEWOOD—Concrete Chuting
 UNION—Pile Hammers
 THOR—Compressors and Air Tools
 KOPPEL—Industrial Cars and Trucks
 STANDARD—Heating Kettles
 CONTINENTAL—Gas Engines
 CHICAGO—Automatic Material Conveyors
 CLEVELAND—Subgrade Scrapers, Form Scrapers

ALBAN TRACTOR COMPANY, Inc.
 821-23 East 25th St. Baltimore, Md.
Representing

CATERPILLAR TRACTOR CO.
 "CATERPILLAR" ROAD MACHINERY
 "CATERPILLAR" COMBINE HARVESTERS
 GENERAL EXCAVATORS
 KILLEFER TILLAGE TOOLS
 LINK-BELT SHOVELS & CRANES
 EUCLID ROAD MACHINERY CO.
 DORSEY STUMP PULLERS
 LA PLANT-CHOATE MFG. CO.
 WILLAMETTE-ERESTED CO.
 BAKER MANUFACTURING CO.
 ROTARY SNOW PLOW CO.
 ATHEY TRUSS WHEEL CO.
 REX-WATSON CORPORATION
 "JAY BEE" FEED MILLS
 DAVEY AIR COMPRESSOR CO.

WORMINGTON & POWERS, Inc.
 601 Southern Bldg. New Orleans, La.
Representing

LITTLEFORD BROS. CO.—MEAD-MORRISON MFG. CO.—Steam, Gas & Electric Hoists & Car Pullers, Full Swing Crawler Cranes
 THE KNICKERBOCKER CO.—Concrete & Mortar Mixers, Saw Rigs
 OSGOOD CO.—Steam, Gas, Electric Cranes, Shovels, Draglines, etc.
 W. A. RIDDELL CO.—Road Building Machinery

MUNDIE MFG. CO.—Gas & Electric Air Compressors
 METAL FORMS CORP.—Building, Gutter, Curb, Sidewalk & Road Forms
 SASGEN DERRICK CO.—Derricks for all purposes

THOS. M. BROWN, INC.

106 So. Gay St. Baltimore, Md.

Representing

KEYSTONE Shovels and Well Drills
 KNICKERBOCKER Concrete, Plaster and Mortar Mixers
 CHICAGO PNEUMATIC Air Compressors and Air Tools
 NOVO Hoists
 HUBER Rollers
 ERIE—Clamshell & Dragline Buckets, Aggregates & Plants
 M & M Form Clamps and Shores
 TOLEDO Torches
 WOOD Shovels
 MARLOW Pumps
 NORTHERN Conveyors

THE R. D. GRIER & SONS CO.
 Machine Shop—Iron & Brass Foundry
 SALISBURY, Del-Mar-Va Peninsula, MARYLAND
Representing

Fairbanks, Morse & Co.
 Wyoming Shovel Works
 Sterling Wheelbarrow Co.
 John A. Roeblings' Sons Co.
 Crane Co.
 National Tube Co.
 International Motor Trucks
 Goodyear Tire & Rubber Co.
 Manhole Frames, Covers & Drain Gates

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CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Ave. New York

C. M. CONANT COMPANY

Bangor Maine

Representing

"CATERPILLAR" Tractors and Graders
 SPEEDER Shovels and Draglines
 SARGENT Snow Plows
 BUHL Compressors
 LaPLANT-CHOATE Bulldozers

D. C. ELPHINSTONE, INC.

115 S. Calvert St. Baltimore, Md.

Representing

Koshing Co.
 T. L. Smith Co.
 Kwik-Mix Co.
 Insys Mfg. Co.
 Parsons Co.
 C. H. & E. Mfg. Co.
 Geo. Haiss Mfg. Co.
 Sauerman Bros., Inc.
 J. D. Adams Co.
 C. S. Johnson Co.
 Gardner-Denver Co.

Owen Bucket Co.
 LaLabour Co., Inc.
 Emerson Pump & Valve Co.
 Bay City Fdy. & Mach. Co.
 H. K. Porter Co.
 Reed Prestice Corp.
 Truscon Steel Co.
 McKiernan-Terry Corp.
 Lambert-National Div.
 Goodall Rubber Co.
 Minwax Co.

Member: Associated Equipment Distributors

JOHN C. LOUIS COMPANY

Incorporated 511 W. Pratt St. Baltimore, Md.

Representing

Jaeger Machine Company
 The Locomotive Engineering Co.
 Consolidated Concrete Machinery Corp.
 American Cable Company
 The Browning Crane Co.
 Burditt Bros. Company
 National Brake & Electric Co.
 Wheeling Corrugating Company
 Good Roads Machinery Company
 Littleford Brothers
 The Feets Company
 Hotchkin Steel Products Company
 Jones Superior Machine Co.
 The Burch Corporation
 Wappat Gear Works

Member: Associated Equipment Distributors

NORTHERN ROAD EQUIPMENT CO.
 82 St. John Street, Portland, Maine
Representing

FOUR WHEEL DRIVE AUTO CO.—"FWD" Trucks
 MAINE STEEL PRODUCTS CO.—"Sargeant" Snowplows
 INTERNATIONAL HARVESTER CO.—Industrial Tractors
 WEHR CO.—Power Road Grader
 TRACKSON CO.—Crawlers, Bulldozers, Loaders
 BAY CITY SHOVELS, INC.—Shovels, Cranes
 SCHRAMM, INC.—Conveyors
 N. P. NELSON IRON WORKS—Loaders
 HUGHES-KEENAN CO.—Cranes, Iron Mules

THE HENRY H. MEYER CO.

110 S. Howard St., Baltimore, Md. 658 Munsey Bldg. Washington, D. C.

Representing

Austin Machinery Co.
 Blaw-Knox Co.
 Boston & Lockport Block Co.
 Brooklyn Locomotive Co.
 Byers Machine Co.
 Chausse Oil Burner Co.
 Connery & Co. Inc.
 Domestic Engine & Pump Co.
 E. I. Du Pont de Nemours & Co.
 Dobbie Fdy. & Machine Co.

Duff-Norton Mfg. Co.
 Harrington Co.
 A. Lechen & Sons Rope Co.
 Pulsometer Steam Pump Co.
 Ransom Concrete Mach. Co.
 Richmond Screw Anchor Co.
 Sterling Wheelbarrow Co.
 Tompkins-Kenly Co., Ltd.
 Toledo Pressed Steel Co.
 Union Iron Works
 Universal Road Machy. Co.

Member: Associated Equipment Distributors

**WE WOULD LIKE TO
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make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Ave. New York

DIRECTORY OF DISTRIBUTORS

MASSACHUSETTS—MICHIGAN

HEDGE & MATTHEIS COMPANY
285 DORCHESTER AVE. BOSTON, MASS.
Member: Associated Equipment Distributors
Albany, N. Y. Buffalo, N. Y.
Providence, R. I. Boston, Mass. Springfield, Mass.
Portland, Maine New Haven, Conn. Worcester, Mass.
Representing
American Tubular Elevator Co. LeRoi Company
Austin Machinery Corp. A. Loschein & Sons Pipe Co.
Boiler Bin Co. Littlefield Bros.
Jones Sweeper Mach. Co. McKiernan-Terry Corp.
Red Star Corp. Lambert-Nal Hoisting Div.
Eaton Car & Construction Co. Mead-Morrison Mfg. Co.
Hercules Motors Corp. Consolidated Concrete Machinery Corp.
Homelite Corporation Sargent Derrick Co.
Hollings-Rand Co. The Ohio Power Shovel Co.
Jagger Machine Co. Toledo Pressed Steel Co.
Lakewood Engineering Co. Wehr Co.
Dobbs Fdy. & Mach. Co. Wood Shovel & Tool Co.
Lawrence Pump & Engine Co. Member: Associated Equipment Distributors

P. I. PERKINS COMPANY
376 Dorchester Ave. Boston, Mass.

Representing

"CATERPILLAR" Tractors
"CATERPILLAR" Graders
ERIE Aggrate Meter Plants
LA PLANT-CHOATE Bulldozers
REX—Pumps

PIERCE—Rollers
BEYERS—Cranes and Shovels
REX—Mixers, Pavers
MUNDY—Hoists
OWEN—Buckets
SCHRAMM—Air Compressors

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470 Fourth Avenue New York

M. B. TYLER COMPANY
344 Columbus Ave. Springfield, Mass.

Representing

"CATERPILLAR" Tractors, Road Machinery and Combines (Conn. & Western Mass. Terr.)
KILLEFER Tractor Implements
LA PLANT-CHOATE Trailers and Snow Plows
WILLAMETTE-ERSTED Hoists for "Caterpillars"
W-K-M Hoists and Rock Crusher for Tractors
DAVEY—Air Cooled Air Compressors
FARQUHAR Boilers and Engines
PIONEER Gravel Equipment, Screens, etc.
HI-WAY SERVICE Snow Plows
DETROIT HARVESTER Mowers and Snow Brushes
EUCLID Scrapers and Wagons
HERCULES Gasoline Rollers
DAY Crushers

THE EARLE EQUIPMENT CO.
6331-51 Tireman Ave. Detroit, Mich.

Representing

KOEHRING CO.
INSLEY MANUFACTURING CO.
T. L. SMITH CO. THE PARSON CO.
C. H. & E. MFG. CO.
FOUR WHEEL DRIVE CO.
ERIE STEEL CONSTRUCTION CO.
CLEVELAND ROCK DRILL CO.
ACME ROAD MACHINERY CO.
SCHRAMM, INCORPORATED
BAY CITY FDRY. & MACH. CO.
ALLIS-CHALMERS Monarch Tractors
LIDGERWOOD Hoists
LE ROI Engines
ROGERS Trailers
LITTLEFORD BROS.
A Complete Line of Small Tools

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CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Ave. New York

Keller Tractor & Shovel Company, Inc.

5124-70 Braden Avenue Michigan

Detroit

Michigan

Distributors of

"CATERPILLAR" Tractors, Graders, Combines
KILLEFER Road and Farm Tools
LA PLANT-CHOATE Bulldozers, Backfillers, Wagons, Snow-plows
ATECO Hydraulic Scrapers
BAKER MANEY Road Scrapers, Snowplows
WILLAMETTE Hoist for "Caterpillars"
AMERICAN HOIST AND DERRICK CO., Gas Shovels, Cranes and Draglines
DETROIT HARVESTER Sweepers and Brushes

DYAR SALES & MACHINERY CO.

66 Broadway Cambridge, Mass.

S. G. Adams Co.—Traffic Signs
J. D. Adams Co.—Motor Graders, Tractor Graders, Road Drags

Arnold Burner Co.—Asphalt "Smokalene" Heaters
Oliver Ames & Sons—Shovels, Scraps

Barnes Mfg. Co.—Pumps
Baker Mfg. Co.—Truck and Tractor Snowplows

Bart Corp.—Spreaders and Unloaders
Gillen Bros.—Concrete Mixers

Chas. Hovey & Co.—Sweepers, Brooms, Sprinklers, Trailers, Asphalt Plants and Sand Spreaders

J. P. Healey Co.—Catch Basin Cleaners
Illinois Wire & Mfg. Co.—Snow Fence

Klein-Logan Co.—Picks, Hammers, Crow Bars

Row-Watson Corp.—Wagons, Trailers

Western Crucible Steel Casting Co.—Shovel Teeth

Wiles Bros.—Multi-Foot Pavers

Pioneer Gravel Equip. Mfg. Co.—Crushers, Screening Plants

CYRIL J. BURKE

Great Lakes Terminal Warehouse
DETROIT MICHIGAN

Representing

Lakewood Engineering Co.
Jaeger Machine Co.

General Excavator Co.
Dobbie Foundry & Machine Co.

Hercules Motors Corp.
J. S. Mundy Hoisting Engine Co.

J. M. Willard Co.
Upson-Walton Co.

A. S. Marlow Co.
Whitcomb Locomotive Co.

R. G. MOELLER COMPANY

14415 Meyers Rd. Detroit, Mich.

Representing

American Tubular Towers
Barnes—Pumps

General—Wheelbarrows, Concrete Carts

Ingersoll-Rand—Compressors, Air Tools

Knickerbocker—Concrete Mixers, Saw Rigs

Lackawanna—Steel Sheet Piling

National—Hoisting Engines and Winches

Sargent—Derricks and Winches

Union—Pile Hammers, Mixers, Air Locks

American Steel & Wire—Wire Rope

Wood—Shovels, Picks and Mauls

Dravo—Bottom Dump Buckets

Tri-Lok—Steel Grating

American Marsh—Redi-Prime Pumps

Homestead Valve—High Pressure Jenny

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MONTHLY

470 Fourth Ave. New York

O'NEAL TOOL & SUPPLY CO.

5327 Livernois Ave. Detroit, Mich.

Representing

BLYSTONE MFG. CO.—Plaster and Mortar Mixers

CHASE FOUNDRY & MFG. CO.—Industrial Cars

GENERAL WHEELBARROW CO.—"Akron" Wheelbarrows,

Concrete Carts, Mortar Boxes, Salamanders, Scrapers, Coal Chutes

STEEL SCAFFOLDING CO.—Adjustable Steel Trestles, Carpenter Brackets, Ladder Jacks, Mortar Board Stands, etc.

Also

Equipment for Concrete Products Plants, Concrete Mixers, Pumps, Engines, Saw Rigs, Gas and Electric Hoists, Shovels, Air Compressors, etc.

E. K. S. EQUIPMENT CO.

18 Grandville Ave., S.W., Grand Rapids, Mich.

Representing

KOEHRING CO. HUBER Rollers
 INSLEY MFG. CO. C. S. JOHNSON CO.
 T. L. SMITH CO. BAKER MFG. CO.
 PARSONS CO. SCHRAMM, INC.
 C. H. & E. MFG. CO. LITTLEFORD BROS.
 LIDGERWOOD MFG. CO. STROUD ROAD MA-
 CHINERY CO.
 MACWHYTE CO. FOUR WHEEL DRIVE
 ROME GRADERS TRUCKS
 ALLIS-CHALMERS CO. Tractors
 NORTHERN Conveyors

Upper Peninsula Tractor Co.

Michigan

Representing

"CATERPILLAR" Tractors
 "CATERPILLAR" Graders
 "CATERPILLAR" Harvesters
 ATHEY Truss Wagons
 ROTARY Snow Plows
 WAUSAU Snow Plows
 KILLEFER Road Machinery
 PIONEER Gravel Equipment
 EUCLID Earth Moving Equipment

HUNTER MACHINERY COMPANY

530 Monroe Ave., N.E. 221 So. Waterman Ave., Detroit, Mich.

Aeroil Heaters, Torches
 Archer Towers
 Bates Wire Ties
 Blaw-Knox Bins, Batches, Forms, Ready-Mix Concrete Plants
 Brookville Locomotives
 Bush Conveyors, Unloaders, Stone Spreaders
 Chain-Belt Mixers, Pavers
 Cleveland Graders, Scrapers
 Clyde Hoists, Derricks
 Homelite Pumps
 Johnson Fire Pumps
 Le Roi Gas Engines

Member: Associated Equipment Distributors

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470 Fourth Ave. New York

Pingry Tractor & Equipment Co.

1239 Buchanan Ave. Grand Rapids, Mich.

Representing

CATERPILLAR—Tractors, Road Machinery, Combines
 LA PLANT - CHOATE—Bulldozers, Trailers, Backfillers, Wagons
 KILLEFER—Road Rippers
 EUCLID—Automatic Scrapers, Wagons
 ATHEY—Truss Wheel Wagons, Trailers
 PIONEER—Gravel Screening, Crushing and Washing Equipment
 WAUSAU—Snow Plows, Tractor Equipment

MICHIGAN EQUIPMENT CO.

Michigan

Representing

NOVO ENG. CO.—Engines, Hoists, Pumps
 INTERNATIONAL HARVESTER CO.—Tractors
 REPUBLIC IRON WORKS—Concrete Mixers
 BALDWIN TOOL WORKS—Shovels
 AMERICAN CABLE CO. — "Tru-Lay" Wire Rope
 SLUSSER-MCLEAN SCAPER CO.—Scrapers
 N. P. NELSON IRON WORKS—Loaders
 Complete Line Small Tools and Supplies

LANGE TRACTOR & EQUIPMENT COMPANY

304 Lake Ave. S Duluth, Minn.

Representing

Caterpillar Tractor Co. Tractors & Road Machinery
 Killefer Mfg. Corp. Road Tools & Farm Implements
 Williamette-Ersted Co. Tractor Hoists
 LaPlant-Choate Mfg. Co. Wagons, Bulldozers, Backfillers, Snow Plows
 Wausa Iron Works Hi-Way Service Corp. Bulldozers, Scarifiers
 Lach Co. Concrete Mixers
 Davey Compressor Co. Air Compressors
 Oshkosh Motors Four-Wheel Drive Trucks
 Diamond Iron Works Gravel Crushing, Screening, Washing Plants

H. E. ERICKSON CO., Inc.

247 Second Ave., So. Minneapolis, Minn.

CONTRACTORS' EQUIPMENT AND SUPPLIES

Knickbocker Concrete Plaster and Mortar Mixers Sackit Spouting Sanger Derricks Column Clamps Elite Scaffold Brackets Novo Engines Novo Hoists Novo Pumps Dragline Buckets Puffer & Hubbard Wheel Barrows Duff Trench Brasses Cement Tools of all kinds Cement Sack Balers Steel Dump Bodies Form Clamps Tie and Form Wire Saw Rigs

GENERAL TRACTOR & EQUIP. CO.

2329 University Ave., S. E., Minneapolis, Minn.

Representing

CATERPILLAR TRACTOR CO.—Tractors and Road Machinery
 KILLEFER MFG. CO.—Road Rippers, Scrapers, Farm Implements
 ATHEY TRUSS WHEEL CO.—Crawler Dump Wagons
 WILLAMETTE-ERSTED CO.—Power Hoists for Caterpillar Tractors
 HIGHWAY TRAILER CO.—Digging Machines, Scrapers and Winches
 LA PLANT-CHOATE MFG. CO.—Bulldozers, Snow Plows, Dump Wagons, Backfillers
 FRED GETTELMAN CO.—Truck Snow Plows
 HI-WAY SERVICE CORP.—Bulldozers, Scraper
 WAUSAU IRON WORKS—Wausa Snow Plows
 LENHART WAGON CO.—Tractor Dump Wagons
 BAKER MFG. CO.—Screeners
 MATTSON WIRE & MFG. CO.—Snow Fence
 AMERICAN TRACTOR EQUIPMENT CO.—Scrapers

FRED W. LEMCKE

Liberty Street and Park Place

JACKSON MICHIGAN

Representing

KNICKERBOCKER—Concrete Mixers, Saw Rigs, Mortar and Plaster Mixers
 NOVO—Gas Engines, Gas and Electric Hoists, Pumps and Dragline Equipment
 CHAUSSÉ—Portable Asphalt Plants, Tar Kettles, Tool Heaters, Mixer Heaters, Torches, Etc.
 AMERICAN-MARSH—Centrifugal Pumps (All sizes and stages)
 NORTHERN—Portable and Semi-Portable Conveyors for Sand, Gravel and Concrete

MINNEAPOLIS EQUIPMENT CO.

514-520 Second St. S. E. Minneapolis, Minn.

Representing

BRODERICK & BASCOM—Wire Rope
 CHAUSSÉ—Asphalt Plants, Oil Heaters
 CLEVELAND—Rock Drills, Air Tools
 DAVENPORT—"Cat Tread" Wagons
 DIAMOND—Gravel Plant Equipment
 FISCHER & HAYES—Concrete Form Devices
 HOTCHKISS—Steel Forms
 HUMPHRIES—Power Pumps
 JONES—Superior Saw Rigs
 JAEGER—Mixers, Hoists, Pumps, Truckmixers
 KARDONG—Column Clamps

KIESLER—Clam Shell Backhoe
 LAKEWOOD—Tow Tractor
 LE TOURNEAU—Crushing Equipment
 MORITZ—Shoveling Machines
 MULTIFOOTE—Pavement Trailers
 MUNDY—Hoisting Engines
 METALWELD—Welding
 NATIONAL—Form Clamps
 NELSON—Spreader Tie
 OSGOOD—Shovels, Cranes, Draglines
 RED STAR—Carla, Wheelbarrows

THORMAN W. ROSHOLT CO.

928 So. Fourth St. Minneapolis, Minn.

Representing

IOWA "Cedar Rapids" Crusher Plants & Equipment
 KOEHRING Pavers, Mixers, Cranes
 INSLY Towers and 1/4-yard Shovels
 PARSONS Trenching Machines, etc.
 MCGREGOR - DEERING Industrial Tractors
 C. H. & E. Saw Rigs, Hoists, Pumps
 KWIK-MIX Mixers

Member: Associated Equipment Distributors

RYAN Graders
 JOHNSON Butchers and Disinfectant Bins
 RIDDELL Power Grader
 TRACKSON Loaders and Cranes
 TRAILMOBILE Semi- and Full Trailers
 VULCAN Steam and Gas Locomotives
 LIDGERWOOD Hoists
 M. & M. Column Clamps
 SARGENT Snow Plows
 METAL FORMS Corp. Steel Forms
 OHIO Tractor Dump Wagons

WM. H. ZIEGLER CO., INC.

2331 University Ave., S. E., Minneapolis, St. Paul and Duluth

Representing

BUCYRUS-ERIE—Gasoline Shovels
 PIONEER—Crushing, Screening, Washing Plants
 REX—Mixers-Pavers, Motor Mixer-Pump-Saw Rigs
 BUTLER—Bins, Batches
 LAKEWOOD—Finishing Machines & Paving Equip.
 BARBER-GREENE—Conveyors, Loaders, Ditchers
 AMERICAN—Hoists & Derricks
 BLACKHAWK—Hydr. Jacks
 ARMSTRONG—Blast Hole Drills

PLYMOUTH—Locomotive Shovels, Track Machines
 GARDNER-DENVER—Air Compressors, Drills
 ARCHER—Towers and Climb Equipment
 RED STAR—Shovels
 LITTLEFORD Tar Heater, Williams—Clamshell Buckets
 PAGE—Drainage Buckets
 LESCHENS—Wire Ropes
 AUSTIN—Backfillers, Trenchers
 VULCAN—Pile Hammers

NORTHFIELD IRON COMPANY

487 Nico St. Northfield, Minn.

Representing

ACME Motor Trucks
 WISCONSIN Snow Plows
 ST. PAUL Dump Bodies
 NIICO Road Graders, Hoses, etc.
 BLIZZARD BUSTER Snow Fence
 INDESTRUCTIBLE Grader, Conveyor Belts
 MODERN Pumps, Generators
 SCHRAMM Air Compressors, Toss
 NIICO & UNITY Culverts
 BLUE DIAMOND STEEL Cutting Edges
 STREICH Wagons
 HIWAY Elevating Graders
 MASSEY-HARRIS 4-Wh. Drive Tractors

TOLEDO Torches, Red Hoses
 GROUNDHOG & MASTER Scrapers
 BADGER Crushers, Screening Plants
 LANSING Concrete Mixer
 RED & YEL TECO Signs
 ROOT Truck Scrapers
 BUTLER Soft Road Bridging
 MASTER Traffic Controls
 BLACK Wire Rope & Cable
 GENERAL Barrows, Shovels
 NEW ENGLAND Loaders
 GILBERT Fresno Shoes
 CAMEL Crawler Wagons
 ADAMS & MODERN Road Markers

BORCHERT-INGERSOLL, INC.

St. Paul, Minn. Duluth, Minn.

American Tubular Towers
 Ball Wagon Graders
 BB All Steel Hand Hoists
 Blaw-Knox Cone Formers, Clamshell Buckets
 Clyde Hoists, Derricks
 Domestic Pumps
 Euclid Crawler Dump Wagons
 Wagons & Automatic Scrapers
 Gation Graders
 Hains Loaders
 Highway Sanders

Koppel Industrial Cars
 McKiernan-Terry Pile Hammers
 Monarch Tractors
 Northern Conveyors
 Northwest Shovels and Cranes
 Kye Steam Pumps
 Ord Road Finishers
 Bansom Pavers and Towers
 "Snow King" Plows
 Stroud Elev. Graders
 Whitcomb Gasoline and Electric Locomotives

DIRECTORY OF DISTRIBUTORS

MINNESOTA—MISSOURI

ALFRED MATSON

Willmar Minn. Representing

DUPLEX MFG. CO.—Motor Graders
GOOD ROADS MACHY.—Good Roads Power Graders, Drawn Graders, Rock Crushing and Gravel Screening Plants, Snow Plows
ROOT SPRING SCRAPER CO.—Big Buster Snow Plows
HAWKEYE MAINTAINER CO.—Pull-type Road Maintainers, Motor Patrols
SHUNK MFG. CO.—Dual Blade Maintainer, Grader and Snow Plow Blades and Edges
JOHNSTON CULVERT CO.—Toncan Molybdenum Corrugated Culverts
CREOSOTED PRODUCTS CO.—Century Creosoted Wood Culverts

BUBLITZ MACHINERY COMPANY

2141 Washington St., Kansas City, Mo. Representing

Jaeger Machine Co.
Lakewood Engineering Co.
Theew Shovel Co.
Universal Crane Co.
McKiernan Terry Corp.
Worthington Pump & Machy. Co.
Whitcomb Locomotive Co.
Butler Bin Co.
G. H. Williams Co.
Slusser McLean Scraper Co.
Foots Co.—Pavers
Ames-Baldwin-Wyoming Shovel Co.
Macwhye Co.
Red Star Products Co.
Sasgen Derrick Co.

LAWRENCE V. FRALEY & SON

Buder Building St. Louis

Exclusive Territorial Representatives

Barber-Greene Company
The Fate-Root-Heath Co.
Plymouth Locomotives
Sauerman Bros., Inc.
Speeder Machinery Corp.
James B. Seavers Co.
Orr & Sembower, Inc.

MISSISSIPPI TRACTOR & EQUIPMENT CO.

301-307 W. Capitol St., Jackson, Miss.

Representing

CATERPILLAR TRACTOR CO.—Tractors and Road Machinery
WILLIAMETTE-ERSTED—Hoists for Caterpillar Tractors
ALL-STEEL PRODUCTS MFG. CO.—Winches for Caterpillar Tractors
SPEEDER MACHINERY CORP.—Crane Shovels and Draglines
TOWERS & SULLIVAN—Tractor Plows
ATLAS SCRAPER CO.—Rotary Scrapers
LA PLANTE-CHOATE MFG. CO.—Dump Wagons, Trailers
LIMA—Shovels, Draglines
EUCLID ROAD MACHY. CO.—Dump Wagons, Bulldozers

DANIELSON TRACTOR & EQUIP. CO.

2233 Grand Avenue Kansas City, Mo.

Representing

CLEVELAND TRACTOR CO.—Cletrac Tractors
GENERAL EXCAVATOR CO.—General Shovels
SCHRAMM, INC.—Air Compressors
HAWKEYE MAINTAINER CO.—Graders and Maintainers
N. S. MONROE & SONS—Graders
SLUSSER-MCLEAN SCRAPER CO.—Master Rotary Scrapers
IOWA MANUFACTURING CO.—Rock Crushers and Gravel Plants
MAINE STEEL PRODUCTS CO.—Snow Plows
ATLAS POWDER CO.—Explosives

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470 Fourth Ave. New York

JOHN R. KEY

1313 So. Garrison St., Carthage, Mo.

Representing

LANDRETH MACHINERY CO.

K-M Grader Patrol

AMERICAN CEMENT MACHY. CO.

Mixers

BARNES MANUFACTURING CO.

Pumps

FUNKHOUSER EQUIPMENT CO.

2425 Jefferson Street

KANSAS CITY MISSOURI

Representing

DIAMOND—Rock Crushers, Gravel Plants
NORTHWEST—Cranes, Shovels, Draglines
DOMESTIC—Pumps and Hoists
RYAN—Graders and Maintainers
SULLIVAN—Compressors, Drills, Air Hoists
LIDGERWOOD—Hoists, Gas, Electric, Steam
AMERICAN—Tubular Towers
RANSOME—Mixers, Pavers, Tower Equipment
ERIE—Bins, Aggregates, Buckets
DOBIE—Derricks and Derrick Fittings
PAXSON—Saw Rigs
AMERICAN—Trulay Wire Rope
Member: Associated Equipment Distributors

CORBY SUPPLY COMPANY

3942-46 West Pine Blvd., St. Louis, Mo.

Representing

BOX CRANE & HOIST CORP.—Electric Cranes and Hoists
BUCKEYE TWIST DRILL CO.—Twist Drills and Reamers
BUHL CO.—Portable Air Compressors
CHAMPION RIVET CO.—Rivets and Welding Rod
DETROIT HOIST & MACHINE CO.—Air Hoists
HARDSCO WONDER DRILL CO.—Rock Drills, Paving Breakers
WM. H. KELLER, INC.—Super Pneumatic Tools
PENNSYLVANIA—Air Compressors and Pumps
DAVID ROUND & SON—Chain Hoists
RIVET CUTTING GUN CO.—Rivet Busters
N. A. STRAND & CO.—Flexible Shaft Equipment
UNION—Portable Woodworking Tools
VAN DORN—Electric Drills, Grinders, Buffers
VICTOR—Welding and Cutting Torches
WESTINGHOUSE—Arc Welding Equipment
GUSTAV WIEDEKE & CO.—Tube Expanders

E. A. MARTIN MACHINERY CO.

501-23 School St. Joplin, Mo.

420 W. Commercial St. Springfield, Mo.

Representing

"CATERPILLAR" Tractors, Road Graders, Combines
WONDER Concrete Mixers
MARSH-CAPRON Mixers
SCHRAMM Air Compressors
DAY Crushers
ATHENY Truss Wheel Wagons
KILLEFER Road Tools
NOVO Engines, Hoists & Pumps
CLEVELAND Red Star Barrows & Carts
BLAKE Type Jaw Crushers
CORNISH Crushing Rolls
LA PLANT-CHOATE Bulldozers
LESCHEN Wire Rope
EUCLID Road Machinery
STERLING Pumping Units

O. B. AVERY COMPANY

1325 Macklind Ave. St. Louis, Mo.

American Steel Works

Buckeye Traction Ditcher Co.
Domestic Engine & Pump Co.
Koppel Ind. Car & Equip. Co.
Luedinghaus Wagon Co.
Toledo Pressed Steel Co.
National Hoisting Engine Co.
Sullivan Machy. Co. Northwest Engrg. Co.
Iowa Mfg. Co. Davenport Loco. Wks.
Butler Bin Co. G. H. Williams Co.
Chain Belt Co. Wood Shovel Co.
Farquhar Company Smith Trailer Corp.
Page Engineering Co.
Member: Associated Equipment Distributors

JOHN FABICK TRACTOR CO.

Gravois & Iowa Aves. St. Louis, Mo.

Representing

Caterpillar Tractor Co.
Euclid Road Machinery Co.
LaPlant-Choate Mfg. Co.
American Tractor Equipment Co.
Baker Mfg. Co.
Killefer Mfg. Co.
Willamette-Ersted Co.
Davey Compressor Co.
W. K. M. Company

WE WOULD LIKE TO HAVE YOU HELP US

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave. New York

FICKESEN-FINNEY EQUIPMENT COMPANY

4930-32 Southwest Ave., St. Louis, Mo.

Representing

BYERS Shovels and Cranes
MARSH-CAPOEN and WONDER Mixers
JOHNSON Bins and Batchers
NOVO Engines, Hoists and Pumps
HAISS Loaders and Conveyors
SCHRAMM Compactors and Tools
Member: Associated Equipment Distributors

ARCHER Concrete Tower Equipment
HOTCHKISS Forms
PORTO Electric Pavers
PAIGE Dragline Buckets
MULTIFOOT Paving Mixers
GOLD MEDAL Dynomite
BOME Graders
LESCHEN Wire Rope
Member: Associated Equipment Distributors

C. F. RABBEITT, INC.

1519-21 N. Broadway St. Louis, Mo.

Representing

BAY CITY Truck Cranes
BLAW-KNOX Bins, Batches, Buckets, Road Formers
C. H. & E. SAW Rigs, Pumps, Hoists and Mortar Mixers
CLEVELAND Formgraders, Subgrade Scrapers, etc.
DIAMOND IRON WKS. Rock Crushing Machy.
A. W. FRENCH "ORD" Concrete Road Finishers
GARDNER-DENVER Rock Drilling Equipment
HUBER Gasoline Rollers
INSLEY Concrete Paving Equipment, Buckets, Chutes
Member: Associated Equipment Distributors

KOEHRING Pavers, Mixers, Cranes, Shovels, etc.
KWIK-MIX Concrete, Mortar and Plaster Mixers
LIDGERWOOD Asphalt Heaters, Pouring Pots, Tools
MADSEN Asphalt and Oil Mixing Plants
PARSONS Trenchers, Backfillers and Ditchers
SMITH Mixers, Pavers, and Agitators
WESTERN Cars and Track Equipment Distributors

THE F. F. SMITH COMPANY

Representing

Ingersoll-Rand Co.
Jaeger Machine Co.
Lakewood Engineering Co.
Le ROI Co.
Owen Bucket Co.
Clyde Iron Works, Sales Co.
Hemelite Corp.
Jones-Superior Mach. Co.
Saginaw Derrick Co.
Universal Crane Co.

Sklisaw, Inc.
Smith Engineering Works
American Steel & Wire Co.
Bates Valve Bag Co.
Hauck Mfg. Co.
McKernan-Terry Corp.
Red Star Products Corp.
Skofield Shovel Co.
Symons Clamp & Mfg. Co.

Franklin and Channing Aves., St. Louis
Member: Associated Equipment Distributors

TULLEY EQUIPMENT CO., INC.

1011 Rossell Blvd. St. Louis, Mo.

Representing

ORTON—Cranes, Shovels, Draglines, Buckets
HELTZEL—Road Forms, Bins & Batchers,
Curb & Gutter Forms
NATIONAL—Air Compressors
LEACH—Mixers, Tower Outfits, Saw Rigs,
ROGERS BROS.—Trailers
HUMPHREYS—Pumps
MILWAUKEE—Gasoline Locomotives
MCANAHAN & STONE—Crushers

HALL-PERRY MACHINERY CO.

802-12 E. Iron St., Butte, Mont.

Representing

American Cable Co.
Butler Bin Co.
Chain Belt Co.
Cleveland Tractor Co.
Climax Engineering Co.
Commercial Shearing & Stamping Co.
Etnyre & Co.
Four Wheel Drive Auto Co.
Gallen Iron Works & Mfg. Co.
Gardner-Denver Co.
Goodyear Tire & Rubber Co.
G. H. Williams Co.

Hazard Wire Rope Co.
Madsen Iron Works
Mohawk Asphalt Heater Co.
Northern Conveyor Mfg. Co.
Novo Engine Co.
Rotary Snow Plow Co.
Sauermaier Bros., Inc.
Smith Engineering Works
Specter Machy, Corp.
Stroud Road Machy. Co.
Willett Mfg. Co.

Member: Associated Equipment Distributors

INTERSTATE MACHINERY & SUPPLY CO.

1006 Douglas St. Omaha, Nebraska

CLIMAX Engines
MARSH-CAPRON Mixers
WONDER Mixers, Pumps and Hoists
NOVO Engines, Pumps and Hoists
BEEBE Hand Hoists
MONARCH Tractors
NORTHWEST Shovels and Cranes
STERLING Wheelbarrows
RED EDGE Shovels, Pickups
WILLIAMS Buckets and Trailers
BUTLER Bins

HOTCHKISS Steel Form Compresors
GARDNER-DENVER Air Compressors
AMERICAN Wire Ropes
BAY CITY Truck Gear
CHICAGO Auto. Cores
JONES-SUPERIOR Saw Rigs
RANSOME Pavers and Trower
MORRIS Sand Pumpers
FISHER & HAYES Form Clamps
BAKER Scrapers
MCKERNAN-TERRY Pneumatic Hammers and Drills
WAUKESHA Engines

Member: Associated Equipment Distributors

Lakewood Equipment Co.

1900 North Ninth St. St. Louis, Mo.
CEntral 9338

Representing

LAKEWOOD Paving and Industrial Equipment
GENERAL Shovels, Skimmers, Cranes, Draglines
LIMA 101 Shovels, Cranes, Draglines
HERCULES Rollers
METALWELD-WORTHINGTON Compressors
CLEVELAND Pneumatic Tools
HUMDINGER Pumps
FAIRBANKS-MORSE Batch Seals
MORITZ Shoulder Machines
MUNDY Hoppers
DOBBIE Derricks
PIONEER Gravel Equipment
OHIO Tractor Dump Wagons
SHANKLIN Road Torches

THE LINCOLN EQUIPMENT AND MATERIALS COMPANY

1510 No. 13th St., St. Louis, Mo.

Representing

Allis-Chalmers—Monarch Tractors
Austin-Western—Graders—Rollers—Crushers
Ransome—Pavers—Mixers—Towers—Chutes
Erie—Bins—Aggregators—Clamshell Buckets
Ingersoll-Rand—Air Compressors and Air Tools
Keystone—Excavators—Skimmers—Pulverizers
Barnes—Pumps—Centrifugal—Plunger and Road Pumps

We Sell or Rent

We Have the Equipment and a Desire to Please

CONNELLY MACHINERY CO.

2706 Montana Ave. Billings, Mont.

Representing

CATERPILLAR TRACTOR CO.—"Caterpillar" Tractors, Harvesters and Road Machinery
ATHY TRUSS WHEEL CO.—Track-Type Wagons and Trailers
LAPLANT-CHOATE MFG. CO.—Snow Plows, Backfillers and Bulldozers
WAUSAU IRON WORKS—Snow Plows
KILLEFER MANUFACTURING CO.—Road Rippers, Rotary Scrapers and Farm Implements
PIONEER GRAVEL EQUIPMENT MFG. CO.—Gravel Crushing and Screening Equipment
WILLIAMETTE-ERSTED COMPANY—Tractor Hoists
BUCKYRUSS-ERIE CO.—Shovels, Draglines, Pull Shovels and Cranes
BUCKEYE TRACTION DITCHER CO.—Trench Excavators and Backfillers

Northwest Equipment Co., Inc.

Box 1112 Great Falls, Mont.

Complete Line of Road Machinery and Contractors' Equipment

Representing

KOEHRING—Mixers
PARSONS—Trenchers
T. L. SMITH—Mixers and Pavers
INSLEY—Concrete Towers & Chuting
D-A—Lubricants
OWEN—Buckets

ELGIN Street Sweepers
COLEMAN Trucks
CLYDE Hoists, Car-Pullers, Derricks
BUHL—Portable Air Compressors, Tools
PIONEER Gravel Equipment

HEYNIGER BROTHERS

Contractors Equipment

6th Ave. and F St. Belmar, N. J.

JAEGER Concrete Mixers
JAEGER Placing Plants
AEROIL Torches, Heaters

Steel Sidewalk and Curb Forms
"Mud Hog" Pumps
Material Elevators
Air Compressors
Gasoline Hoists
Trench Pumps
Carbide Lights

Wheelbarrows
Mortar Tubs
Steel Mortar Boxes
Picks and Shovels
Tarpaulins
Scaffold Horses
Electric Drills & Saw
Chain Hoists

BAUER TRACTOR COMPANY, Inc.

81 Water St. Bridgeton, N. J.

Representing

CATERPILLAR TRACTOR CO.
Tractors — Graders — Combines
LaPLANT-CHOATE MFG. CO.
KILLEFER MFG. CO.
HI-WAY SERVICE CORP.
WILLAMETTE-ERSTED CO.
EUCLID ROAD MACHY. CO.

NORTH JERSEY TRACTOR CO., Inc.

Bell Terminal Garwood, N. J.

Representing

Caterpillar Tractor Co.
Allsteel Products Mfg. Co.
American Tractor Equipment Co.
Athey Truss Wheel Co.
Atlas Scraper Co.
Davey Compressor Co., Inc.
Detroit Harvester Co.
Day Pulverizer Co., Inc.
Doway Brothers
Euclid Road Machinery Co.
Hiway Service Corp.
Killefer Mfg. Corp.
LaPlant-Choate Mfg. Co., Inc.
The Miami Scraper Co.
Moritz-Bennett Corp.
W-K-M Company, Inc.
Wausau Iron Works
Willamette-Ersted Co.

AMERICAN MACHINERY & SUPPLY COMPANY

1113-17 Howard St. Omaha, Nebr.

Representing

Jaeger Mixers & Pumps
Link-Belt Shovels & Draglines
Sullivan Air Compressors and Tools
Red Star Wheelbarrows
L. R. Engines
True Lay Wire Rope
Whitcomb Locomotives
H. B. Gravel Pumps
Johnson Bins and Batchers
Aeroil Brothers
Saginaw Derricks

Sterling Hoists
Waukesha Engines
Lakewood Finishing Machines
Lakewood Towers, Buckets and Cars
Owen Clamshell Buckets
Buckets Trench Machines & Backfillers
Multi-Footed Pavens
Barber - Greene Ditchers, Lenders, Belt Conveyors

Member: Associated Equipment Distributors

FUCHS EQUIPMENT COMPANY

1124 Farnam Ave. Omaha, Neb.

Representing

REX Pumps, Saw Rigs
REX Mixers and Pavers
BLAW-KNOX Form Buckets
AMERICAN Manganese Pumps
M. & M. Form Clamps
BUCKYRUSS-ERIE Shovels
LITTLEFORD Asphalt Heater
SAUERMAN Cableways
INGERSOLL-RAND Compresors
LE ROI Engines
WHITCOMB Locomotives
TEL-SMITH Crushers

BARNES Pumps
CLYDE Hoists
GENERAL Wheelbarrows
LESCHEN Hercules Cable
ATLAS Shores
ERIE Gravel Pumps
TWIN CITY Engines
WAUKESHA Engines
WOODS Molybdenum Shovels
ORD Cone, Road Finishers
DU PONT Explosives
LINN Tractors
WARCO Graders
BATES Bar Ties

Member: Associated Equipment Distributors

C. A. LIPPINCOTT & BROS., INC.

3rd and Union Streets

MOORESTOWN, N. J.

Phone 263

Representing

CLETRAC Crawler Tractors
ADAMS Leaning Wheel Graders
SCHAEFER Automatic Scoops
SARGENT Snow Plows
BAKER Snow Plows
ESSEX Bulldozers
KILLEFER Road Building Tools

DIRECTORY OF DISTRIBUTORS

NEW JERSEY—NEW YORK

Dale & Rankin, Inc.

113 Frelinghuysen Ave., Newark, N. J.

Distributors of

Ingersoll-Rand Compressors and Tools
Marsh-Capron and Wonder Mixers
Marlo Pumps
Jones Superior Saw Rigs
Sterling Wheelbarrows
Aeroil Heaters and Tools

INTERSTATE EQUIPMENT CORP.*Construction Equipment Division*

331-33 South St. Newark, N. J.

Representing

BUCKEYE TRACTION DITCHER CO.—Trench Excavators

ATLAS MINERAL PRODUCTS CO.
Genuine "G. K."SANITARY SEWER BASIN CO.
Manholes, Catch Basins**JOHNSON & DEALAMAN, Inc.**

60 Marshall St. Newark, N. J.

Representing

RANSOME Pavers, Mixers and Chuting Equipment
PARIS—Transit Mixers
JOHNSON Steel Bins and Batchers
ERIC Gasoline Rollers
BAY CITY Truck Cranes
CARTER Centrifugal, Diaphragm and Force Pumps
LAKEWOOD Finishing Machines, Subgraders and Forms
WILLIAMS Trailers and Buckets
RED STAR Wheelbarrows, Batch Boxes, and Adjustable Shores

C. H. LOOMIS & CO.

304 Jelliff Ave. Newark, N. J.

Representing

Chain Belt Co.
Schramm, Inc.
DeWalt Products Co.
Heltzel Steel Form & Iron Co.
Le Roi Co.
Jackson Mfg. Co.
Aeroil Burner Co.
Cleveland Rock Drill Co.

TRACTOR & EQUIPMENT CO.

520-522 Passaic Ave. Newark, N. J.

Representing

MCGOWAN-DEERING Industrial Tractors
HUGHES-KEENAN Iron Mules and Cranes
TRACKSON Full Crawlers, Cranes, Loaders
WEHR Graders and Rollers
BLAIR Bulldozers and Diggers
THALEG & HOCK Travel Cranes
DETROIT HEAVESTER Sweepers
JOLLET International Hoists
BARTON Portable Pumps
MIAMI Scrapers and Trailers
SARGENT Snow Plows
UNIT Shovels, Clamshells, Cranes

CONTRACTORS SALES CO., Inc.

56 So. Ferry St. Albany, N. Y.

Representing

Allis-Chalmers Monarch Tractors
Link Belt Co.
Lakewood Engineering Co.
General Excavator Co.

J. H. WELCH COMPANY, Inc.Sales, Rental and Service
254 Court Street Buffalo, N. Y.*Representing*

ARCHER Towers & Chuting Equipment
BARNES Pumps
CLYDE Hoists & Derricks
DEWALT Power Saws
ERIE Bins & Aggregates
HAUCK Concrete Heaters and Thawers
JOYCE Jacks
LEROI Engines, Parts
LINK BELT Cranes, Shovels
MASTER and WONDER Mixers

MILBURN Lights
PATENT SCAFFOLDING
PERFECT Form Ties
ROOSHORS Forming System
Column Clamps
RUMSEY Industrial Pumps
SKILSAWS Sanders Tools
SULLIVAN Compressors
Pneumatic Tools
WILLIAMS Form Clamps
WYOMING Red Edge Shovels

HENDRICKS & SHULTZ, INC.

Broadway Arcade Bldg., Albany, N. Y.

Representing

ALLIS-CHALMERS MFG. CO.—Tex rope Drives
AMERICAN SKYLIGHT CO.—Skylights
ATLAS ENGINEERING CO.—Conveyors
BAY CITY SHOVELS, INC.—Shovels
BLAW-KNOX CO.—Grating and Floor Guard
CLEVELAND ROCK DRILL CO.—Drills
P. S. BENEDICT CORP.—Machine Guards
DEISTER CONCENTRATOR CO.—Screens
PIERCE GOVERNOR CO.—Rollers
ROME MFG. CO.—Graders
THERMOID RUBBER CO.—Belts, Hose, Packing
UNION IRON WORKS—Pile Hammers

THE WHEELER EQUIPMENT CO.

329-331 Ellicott St. Buffalo, N. Y.

Representing

ATLAS—Shores
CARTER—Pumps
CLEVELAND—Rock Drills, Tools
ESSICK—Plaster Mixers
HOTCHKISS—Steel Forms
HUG—Roadbuilders Trucks, Subgraders
JONES-SUPERIOR—Woodworkers
LIMA "101"—Shovels
LITTLEFORD—Heating Kettles, tools
McCORMICK—Deering Industrial Tractors, Attachments

MEAD-MORRISON—Shovels, Cranes, Tractors
NATIONAL—Hoists
NELSON—Loaders
NOVO—Engines, Hoists
RICHMOND—Tyrscus, Anchors
RAY-SIGNS—Traffic Signs
ROGERS—Trailers
ROTARY—Snow Plows
SARGENT—Snow Plows
SCHRAMM—Air Compressors
WEHR—Graders, Rollers

SLADE TRACTOR CO., Inc.

36 Learned Street Albany, N. Y.

Representing

"CATERPILLAR" Tractors, Road Machinery, Combines
LaPLANT CHOATE Track Wheel Wagons, Bulldozers and Snow Plows
EUCLID Rotary and Wheel Scrapers, Track Wheel Wagons
KILLEFER Agricultural Implements and Contracting Tools
WILLAMETTE-ERSTED Hoists for "CATERPILLAR" Tractors
ATHREY TRUSS Wheel Wagons and Trailers
THOR Compactors—Pneumatic and Electric Tools
DETROIT Harvester Mowers and Snow Brush
SCHRAMM Air Compressors
ROCK ISLAND Agricultural Implements
W-K-M Booms for "CATERPILLAR" Tractors
DORSEY Stump Puller
BLAW-KNOX Ateco Equipment
MICHIGAN Power Shovels

Z. T. DARROW & SON

Niagara Street Canadaigua, N. Y.

Representing

KEYSTONE DRILLER CO.
Power Shovels
W. A. RIDDELL CO.
Power Graders
RYAN MANUFACTURING CORP.
Power or Hand Control Graders
THE OHIO LOCOMOTIVE CRANE COMPANY
Excavators
METALWELD INC.
Air Compressors

LLOYD G. ROSS

3090 Main St. Buffalo, N. Y.

Representing

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Hercules Roller Co.
National Brake & Electric Co.

J. I. BINGHAMContractors' Equipment
110 Walnut St. Elmira, N. Y.*Representing*

Wickwire-Spencer Steel Co.
Mohawk Asphalt Heater Co.
Hotchkiss Steel Products Co.

H. B. TREVOR CO., INC.

197 Van Rensselaer St. Buffalo, N. Y.

Representing

NATIONAL EQUIPMENT CORP.
Koehring Co. T. L. Smith Co.
Insley Mfg. Co. Kwik-Mix Co.
Parsons Co. C. H. & E. Mfg. Co.

BLAW-KNOX CO.
CHICAGO PNEUMATIC TOOL CO.

EUGENE F. VAN NAMEHorseheads, N. Y.
116 John St.*Representing*

HUBER—Rollers and Crushers
BAKER—Road Drags, Snow Plows
BATES—Tractors
BURCH—Belt Conveyors
C. M. C.—Wonder & Marsh-Capron Mixers
HANSON—Excavators
JACKSON—Wheelbarrows
MILES—Concrete Block Machines
SCHRAMM—Air Compressors
STOCKLAND—Road Graders

GEORGE MALVESE & COMPANY
Jericho Turnpike, Near Nassau Blvd.
GARDEN CITY PARK
Post Office: NEW HYDE PARK, N. Y.
Representing
CLETRAC Crawler Tractors
SCHAFFER Automatic Scrapers
ROME Graders
OIL JACKS
EUCLID Scrapers
ACME Rd. Machine
OLIVER Plows
WALSH Snow Plows

WIARD Plows
EVERSMAN Land Levelers
WESTERN BLOCK CO. Blocks
BRODERICK & BASS Wire Rope
"DOT" Lubricating System
GRAPHOL Penetrating Oil
CASE & McCORMICK-DEERING Tractors

STERLING TRACTOR EQUIPMENT CO.
Equipment for CASE, FORDSON, and McCORMICK-DEERING Tractors
62 Bush Street Brooklyn, N. Y.
Representing
J. I. CASE CO., INC.—Industrial Tractors and full line of Tractor Equipment
TRAIL-IT CO.—Hitches for Wagons, Trucks and Tractors, Etc.
CLYDE IRON WORKS SALES CO.—Hoists for the Fordson
CASE & McCORMICK-DEERING—Tractors

COMPLETE MACHINERY & EQUIPMENT CO., Inc.
"Specialists in Pumps"
Webster Ave. and Hancock St. Long Island City New York
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HUMPHREYS MFG. CO.—Diaphragm, Plunger and Centrifugal Pumps
LEACHE CO.—Concrete Mixers
INGERSOLL-RAND CO.—Air Compressors
ECONOMY SCAFFOLD CO.—Steel Harnesses
CLYDE IRON WORKS SALES CO.—Gantries
Hoists
—Steel Blasting Mats—
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JOHN R. TINKLEPAUGH
LIVINGSTON NEW YORK
Also
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Distributors
CLETRAC Tractors, New and Rebuilt
EUCLID Wheel Scrapers and Freshers
SARGENT Snow Plows
FORDSON Tractors
SHAWNEE One-man Pull-type Graders
GALION Road Graders
JOHN DEERE Plows
ESSEX Hydraulic Backfillers
WALSH Hydraulic Snow Plows
WALSH Bulldozers

H. O. PENN MACHY. CO., INC.
140th St. & East River Bronx, N. Y.
Representing
BYERS MACHINE CO.—WARCO—Graders
Convertible Cranes and ARCHER IRON WORKS—
Shovels Mast Hoists, Towers
CHAIN BELT CO.—"REX" REX—Diaphragm, Plunger
Mixers, Pavers, Mortar and Centrifugal Pumps
Plaster Mixers, Saw Rigs HOTCHKISS STEEL PRODUCTS CO.—Sidewalk and
BUHL AIR COMPRESSORS Road Forms
McCORMICK-DEERING—
Tractors and Accessories BUTLER BIN CO.—Bins and
AMES Gasoline Rollers Measuring Devices
TRACKSON Crawlers, Shovels and Bulldozers
OHIO Tractor Dump Wagons
Warehouse Stock—Service Station
Member: Associated Equipment Distributors

Contractors Trading Company
Contractors' Equipment and Supplies
232 Fulton Street New York
Representing
Ingersoll-Rand Co.
Domestic Engine & Pump Co.
Contractors' Safety Hooks
Weldless Pile Bands
"A Complete Service for the Contractor"

Forsythe Brothers
CONTRACTORS & INDUSTRIAL EQUIPMENT
37-01 Vernon Ave. Long Island City
Distributors
SPEEDCRANES — Shovels, Draglines and Trenchhoes
CLEVELAND—Rock Drills, Air Tools, etc.
MEAD-MORRISON—Shovels, Cranes
METALWELD-WORTHINGTON—Portable Air Compressors
HERCULES—Gas Engines
DERRICKS — HOISTS — AIR TOOLS

STUMPP & LEHTI
Contractors' Equipment
427 Manida Street Bronx, N. Y.
Representing
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Shovels — Cranes — Draglines
IOWA MANUFACTURING CO.
Crushers — Sand and Gravel Plants
DERRICKS — HOISTS — AIR TOOLS

A. P. DIENST CO.
Contractors' Supplies
140th St. & 3rd Ave., New York, N. Y.
Distributors
TOLEDO Bull Frog Wheelbarrows
WYOMING Red Edge Shovels
DUFF Sewer Trench Braces
GREDAK Grease
Telephone Mott Haven 9-5430

EDWARD EHRBAR, Inc.
29 Meserole Ave. Brooklyn, N. Y.
Brockway Place White Plains, N. Y.
Contractors' Equipment Sales and Rentals
Agents for
JAEGER Concrete Mixers
JAEGER Plaster Mixers
JAEGER Mortar Mixers
JAEGER Pumps
NATIONAL Hoists
JONES-SUPERIOR Saw Tables

"Brooks for Concrete Equipment"
R. E. BROOKS COMPANY
Equipment for Contractors
50 Church Street New York, N. Y.
NATIONAL EQUIPMENT CORP.
KOERHERRING CO.
INSLEY MFG. CO.
T. L. SMITH CO.
PARSONS CO.
HUBER MFG. CO.
C. H. & E. MFG. CO.
BLAW-KNOX CO.
CLYDE IRON WORKS
HANDY SACK BAKER CO.
CLEVELAND ROCK DRILL CO.
ORD CONCRETE ROAD FINISHERS
ALLIS-CHALMERS (Monarch Tractors)

FITZGERALD & HUDSON
445 W. 26th St. New York City
Representing
RANSOME Concrete Machinery
TRANSIT Truck Mixers
HANSON Shovels and Cranes
HOTCHKISS Steel Forms
LINK BELT Shovels and Cranes

H. M. HIRSCHFELD
16th Ave. & 63rd St. Brooklyn, N. Y.
Representing
ORR & SEMBOWER, INC.
THE LAUSON CORP.
AMERICAN SAW MILL MACHINERY CO.
CONNEAUT SHOVEL CO.
THE LE ROI CO.

BROWN & SITES COMPANY
Specialists in Contractors' Equipment
Main Office: 30 Church Street
NEW YORK CITY
Exclusive Representative
Lakewood Engineering Co.
Mundy Hoisting Engine Co.
Dobie Fdy. & Machine Co.
Lawrence Machine & Pump Co.
Midwest Locomotive Works

HOLT & THOMAS, Inc.
50 Church St. New York, N. Y.
Representing
ALLIS-CHALMERS "Monarch" Tractors
ALLIS-CHALMERS Wheel Type Tractors
ALLIS-CHALMERS Agricultural Tractors
BAY CITY Truck Cranes
NEISS Mechanical Bulldozers
ROTARY Snow Plows
WEHR Graders & Rollers
HUGHES-KEENAN Iron Mules
TRACKSON Crawlers, Cranes & Loaders
BLAIR Bulldozers & Loaders
SARGENT Snow Plows
and other leading manufacturers

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Oklahoma City Oklahoma

Representing

ALLIS-CHALMERS MFG. CO.
Monarch and United Tractors with Allied Equipment

EUCLID ROAD MACHINERY CO.

Dump Wagons

ARMCO CULVERT MFG. ASSN.

Armed Ingot Iron Culverts

KILLEFER MFG. CORP.

Revolving Scrapers—Rippers

DIRECTORY OF DISTRIBUTORS

WE WOULD LIKE TO HAVE YOU HELP US

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Avenue New York

LELAND EQUIPMENT COMPANY
Tulsa—Oklahoma City
OKLAHOMA

Distributors for

NATIONAL EQUIPMENT CORP.—Concrete Mixers, Pavers, Chuting Equipment, Towers, Derricks, Hoists, Pumps, Excavators, Cranes, Trenching Machines and Back-Fillers
BLAW KNOX CO.—Bins, Forms, Buckets
IOWA MANUFACTURING CO.—Rock Crushing Plants
SCHRAMM, INC.—Air Compressors, Pneumatic Tools
McGROKEY—Torches
McKERNAN-TERRY CORP.—Pile Hammers, Steam, Electric and Gasoline Hoists
ST. PAUL HYDRAULIC HOIST MFG. CO.—Hydraulic Hoists and Dump Trailers
C. H. & E.—Portable Saw Rigs
Conveyors, Loaders, Wheelbarrows, Tar Kettles
Complete Line of Truck Equipment

MILLER-SANFORD TRACTOR CO.
Eugene — Klamath Falls — Medford
Roseburg
OREGON

Representing

Caterpillar Tractor Co.
Tractors — Graders — Harvesters
American Tractor Equipment Co.
Killefer Manufacturing Co.
Willamette-Ersted Co.

BUNTING TRACTOR COMPANY
LA GRANDE, OREGON

Representing

Caterpillar Tractor Company
"Caterpillar" Tractors
"Caterpillar" Combines
"Caterpillar" Road Machinery
Athey Truss Wheel Company
LaPlant-Choate Mfg. Company
American Tractor Equipment Co.
Killefer Manufacturing Company
Willamette-Ersted Company
Williamsport Wire Rope Company

LOOK THIS DIRECTORY
OVER CAREFULLY

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CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Ave. New York

BALZER MACHINERY COMPANY

275 Pine Street Portland, Ore.

Representing

Marion Steam Shovel Co.—Large Power Shovels
Ohio Locomotive Crane Co.—Locomotive Cranes
Gardner-Denver Co.—Air Compressors, Drills, etc.
Wheeling Mold & Foundry Co.—Jaw Rock Crushers
Byers Machine Co.—Small Power Shovels
Niagara Concrete Mixer Co.—Vibrating Screens
Superior Engine Co.—Conveyors, Loaders, etc.
S. D. LeClair Co.—Dragline Buckets
Chicago Automatic Conveyor Co.—Conveyors, Loaders, etc.
J. S. Mundy Hoisting Engine Co.—Steam, Gas and Electric Hoists
Ohio Tractor Dump Wagons

LOGGERS & CONTRACTORS
MACHINERY COMPANY

345 E. Madison St. Portland, Ore.

Representing

Caterpillar Tractor Co.
Link Belt Co.
Archer Iron Works
Athey Truss Wheel Co.
LaPlant-Choate Mfg. Co.
Killefer Manufacturing Corp.
Chain Belt Co.
Butler Bin Co.
Speeder Machinery Corp.
Plymouth Locomotive Works
G. H. Williams Co.
Buckeye Traction Ditcher Co.
Willamette-Ersted Co.
American Tractor Equipment Co.

CLYDE EQUIPMENT CO.

Contractors' Equipment and Supplies

Portland, Oregon Seattle, Wash.

Acme Road Machy. Co. Sauvener Brothers
Clyde Iron Works Lakewood Engineering Co.
Homelite Corp. Sterling Wheelbarrow Co.
Jaeger Machine Co. Sullivan Machinery Co.
Lee Trailer & Body Co. Taylor Engr. & Mfg. Co.
Lincoln Electric Co. McKleran-Terry Corp.
Buycrus-Erie Co. Klauber Mfg. Co.
Connexus Shovel Co. Footh Company Inc.
Geo. Haiss Mfg. Co. Inc. Atlas Imperial Diesel Eng. Co.
Member: Associated Equipment Distributors

McCRAKEN-RIPLEY CO.

61-67 Albina Ave. Portland, Ore.

Representing

Ransome Concrete Machinery Co.—Mixers, etc.
Atlas Lummite Cement Co.—Lummite Cement
Universal Atlas Cement Co.—White Cement
Union Metal Mfg. Co.—Metal Columns
M. & M. Form Clamp Co.—Form Clamps
Blystone Mfg. Co.—Plaster Mixers
Red Star Products Corp.—Red Star Wheelbarrows, Concrete Carts
W. R. Meadows, Inc.—"Seal-Tight" Expansion Joints
Northern Conveyor & Mfg. Co.—Portable Conveyors
Patent Scaffolding Co.—Swinging and Tubular Scaffolds

FEENAUGHTY MACHINERY CO.

320-338 Belmont St. Portland, Ore.
Spokane — Seattle — Boise

Representing

American Saw Mill Penna. Boiler Works
Machinery Co. Pickering Governors
Chicago Pneumatic Tool Co. Sidney Steel Scrapers
Construction Machy. Co. Sterling Wheelbarrows
Four Wheel Drive Auto Co. Trow Shovel Co.
Gallen Iron Works and Mfg. Co. Universal Crane Co.
Co. Diamond Iron Works
Footh Bros. Gear and Birdseye Mfg. Co.
Machine Co. Avery Power Machinery Co.
Littleford Bros. Massey-Harris Co.
Member: Associated Equipment Distributors

MITCHELL, LEWIS & STAVER CO.

330 E. Morrison St. Portland, Ore.

Representing

ANTHONY CO.—Hydraulic Dump Bodies
SOLANO IRON WORKS—"Pacific" Revolving Tractor Scrapers, Fresno Scrapers
THE NEW WAY MOTOR CO.—Air-Cooled Engines
STOVER MFG. & ENGINE CO.—Gasoline Engines
THE F. E. MYERS & BROTHER CO.—Power Pumps

HOWARD-COOPER CORPORATION

Portland — Seattle — Spokane — Twin Falls

Representing

Allis-Chalmers Mfg. Co. Orton Crane & Shovel Co.
(Monarch Tractors) Rotary Snow Plow Co.
Austin Machinery Corp. Schramm, Inc. (Compressors)
Barber-Greene Co. Universal Power Shovel Co.
Cleveland Rock Drill Co. The Buda Co. (Diesel & Gas Engines)
Ryan Mfg. Corp. Baker Mfg. Co.
Good Roads Mfg. Co. Walter Motor Truck Co.
Hughes-Keenan Co. The Truxton Co.
Lecta Co. Ahrens-Fox Fire Engine Co.
Nordberg Mfg. Co. (Symons Crushers) Pacific Goudich Rubber Co.
Member: Associated Equipment Distributors

Western Road Machinery Co.

220-222 E. Water St. Portland, Ore.

Representing

SMITH ENGINEERING WORKS—Talmith Crushers
MADSEN IRON WORKS—Portable Asphalt Paving Plants
WORTHINGTON PUMP & MACHINERY CORP.—Worthington Compressors, Worthington-Gillman Air Tools
OHIO POWER SHOVEL CO.—LIMA 1 & 1 1/4 yd. Shovel
HUBER MFG. CO.—Road Rollers
J. D. ADAMS CO.—Adjustable Leaning Wheel Graders
HIGHWAY—Heavy-Duty Machinery Trailers
MUNICIPAL SUPPLY CO.—Oil Distributors
GENERAL EXCAVATOR CO.—General Half Yard Shovel
NOVO ENGINE CO.—Engines, Hoists and Pumps
Member: Associated Equipment Distributors

J. L. LATTURE EQUIPMENT CO.

312-14 E. Madison St. Portland, Ore.

Representing

Keystone Driller Co. Lauson Mfg. Co.
The Knickerbocker Co. Le Rei Co.
American Steel Scraper Co. Morethorn Corp.
Wood Shovel & Tool Co. Autocar Co.
Union Iron Works Climax Engineering Co.
Blaw-Knox Co. The Muzzen Co.
Home Mfg. Co. Buffalo-Springfield Roller Co.

G. M. STULL COMPANY

Chester Pennsylvania

Representing

Fordson Tractors
Universal Power Shovels
Road Machinery
Contractor's Supplies

"Equipment and Supplies for the Fordson"

Barnard Tractor & Equipment Co., Inc.
825 Paxton Street Harrisburg, Pa.

Representing

CATERPILLAR—Tractors and Road Machinery
LaPLANTE-CHOATE—Wagons, Backfillers, Bulldozers, Snow Plows, Scrapers
BAKER—Mowers and Drags
RUSSELL—Drags, Scoops
DOMESTIC—Pumps
DAVEY—Air Compressors
CLEVELAND—Air Tools
ATHHEY—Crawler Wagons
EUCLID—Crawler Wagons
WILLIAMETTE—Tractor Hoists and Logging Equipment
KILLEFER—Agricultural Tools and Scrapers

BURCH—Stone Spreaders, Castings, Conveyors
HIGHWAY—Trailers
MIAMI—Trailers, Scrapers
W-K-M—Pipe Handling Equipment
B L A W - K N O X —Wagon
DAY—Crushers
DETROIT—Road and Street Brushes
MILBURN—Carbide Lights, Paint Spray Outfits
WILLIAMS—Clam Shell Buckets

EDELEN & BOYER COMPANY

Office and Warehouse 236 N. 23rd St. Philadelphia Penna.

Distributors for

Lima "101" Shovel, Crane & Trencher
General Shovels, Cranes, Skimmer, Back Hoe
Multi Footed Pavers
Flory Hoists
Freeman Turntables
Hetzell Steel Road Forms
Hetzell Sidewalk & Gutter Forms
Bissell & Bissell
Sagamore Derricks & Elevators
Wonder Mixers and Pumps
Miles Block Machines
Pulsometer Steam Pumps
Member: Associated Equipment Distributors

CMC Gasoline Hoists
Olmsted Platform Trailers
Hayward Clamshell Buckets
Archer Concrete Towers and Chuting Plants
Marsh-Capron Mixers
Mario Mud and Water Pumps
Bay City Truck Cranes
Haus Loaders, Unloaders and Belt Conveyors
Tru-Lay Steel Cable
Reynolds Constr. Furnaces
Jackson—Wheelbarrows, etc.

REEVES-McCORMICK, Inc.
5317 N. 2nd St. Philadelphia

Representing

NOVO—Pumps, Hoists and Engines
FORDSON—Tractors and Accessories
WEHR—Graders
STERLING—Cranes and Tractors
ERIE—Bins and Buckets
CONNERY—Kettles and Asphalt Heaters
INDEPENDENT "THOR"—Air Compressors

HERR "THE PUMP MAN"
Lancaster Penna.

Representing

Gould Pumps, Inc., Pumps
Jaeger Machine Co., Mixers, Hoists
Century Electric Co., Motors
Louden Machinery Co., Barn Equipment
Domestic Engine & Pump Co., Hoists and Compressors and Pumps
Fuller & Johnson Co., Gas Engines
Metalweld-Worthington Air Compressors
Wood Working Machinery
Barrows and Cement Tools

GILES & RANSOME

231-33 No. 12th St., Philadelphia, Pa.

RANSOME CONCRETE MACHINERY CO.—Concrete Mixers and Appliances
BLAW-KNOX CO.—Clam-shell Buckets, Steel Forms, Steel Buildings, Steel Bins

RICHMOND SCREW ANCHOR CO.—Concrete Specialties

THE BARNES MFG. CO.—Centrifugal Diaphragm and Force Pumps
NORTHWEST ENGINEERING CO.—Gasoline Cranes and Shovels

ORD—Road Finishing Machine
CLYDE—Hoisting Engines and Derricks
Member: Associated Equipment Distributors

SERVICE SUPPLY CORPORATION

20th and Venango Sts.
PHILADELPHIA, PA.

Chain Belt Co.—Rex Pavers, Mixers, Pumps
Owen Bucket Co.—Clamshell Buckets
Lidgerwood Mfg. Co.—Hoists, Winches, Cableways
Dravo Equipment Co.—American Tubular Towers
Hercules Co.—Road Rollers
International Harvester Co.—Industrial Tractors
Allis-Chalmers—Monarch Tractors
Bay City Shovels, Inc.—Shovels, Cranes and Cranemobiles
W. A. Riddell Co.—Graders, Scrapers & Tracks for Trucks
Budler Bin Co.—Bins, all sizes
R. B. Carter—Pump
Trackson Co.—Crawlers, Shovels and Bulldozers
Chicago Pneumatic Tool Co.—Air Compressors and Tools
Littleford Bros.—Asphalt and Tool Heaters
Member: Associated Equipment Distributors

BOWEN MACHINERY CO.
Excavating—Construction—Industrial EQUIPMENT

1126 N. Delaware Ave. Philadelphia, Pa.

Representing

BYERS MACHINE COMPANY Shovels, Cranes, Draglines
G. H. WILLIAMS CO. Clamshell and Dragline Buckets, Heavy Duty Trailers
TAYLOR-WHARTON IRON & STEEL CO. Manganese Shovel and Bucket Teeth

LODER & SHARP, INC.

"Everything for Roads"
32nd Street and Powelton Avenue
PHILADELPHIA, PA.

Representing

F. W. D. Trucks
BATES Tractors
ROME Graders
RELIANCE Crushers
HUBER Rollers
WHEELING Pipe

J. JACOB SHANNON & CO.
1744 — Market Street — 1744
PHILADELPHIA

Representing

Jaeger Concrete Mixers Wyoming "Red Edge" Shovel
Lakewood Road Equipment Jaeger Truck Mixers
Mundy Hoisting Engines Lakewood Material Town
American-Gopher Crawler Crane
Crane
Red Star Shores & Columns Terry Steel Derrick
Clamps
Sagamore Derricks & Winches Red Star Barrows & Carts
Berg Concrete Surfaceers Berg Hi-Way Surface
Williams Trailers Williams Clam Shell Bins
Jaeger Hoists
Multiplex Electric Saws
Bates Wire Ties & Tying Tools
Kwik-Mix Concrete Mixer Co.
National Brake & Electric Co.
Reebling Wire Rope

CONTRACTORS EQUIPMENT & SUPPLY CO.

800 No. Delaware Avenue
Philadelphia Pennsylvania

Representing

THE MARION STEAM SHOVEL CO. Steam, Gas, Gas-Electric
Diesel and Electric
Shovels—Drag Lines—Cranes
AMERICAN STEEL SCRAPER CO. Wheelbarrows—Scrapers—Road Drags
A. LESCHEN & SONS ROPE CO. Hercules "Red Strand" Wire Rope
MORSE-STARRATT PRODUCTS CO. Wire Cable Cutter and Bands

MAERKY MACHINE WORKS

632 Race Street
Philadelphia Penna.

Representing

The Climax Engineering Co.
Twin Disc Clutch Co.
Modern Equipment Co.

LEE T. WARD CO., Inc.
2361 E. Tioga St. Philadelphia

Koehring Co.
Inslay Mfg. Co.
Parsons Co.
T. L. Smith Co.
General Wheelbarrow Co.
C. H. & B. Mfg. Co.
C. S. Johnson Co.
Hotchkiss Steel Form Co.
Universal Form Clamp Co.
National Hoisting Engine Co.
Kwik-Mix Concrete Mixer Co.
National Brake & Electric Co.

DE HUFF AND HOPKINS
261 N. Broad Street Philadelphia

Representing

SPEDER MACHINERY CORPORATION 46 yd., 1/2 yd. and 1/4 yd. full revolving Shovels & Cranes
Motor Truck Cranes
EASTON CAR & CONSTRUCTION CO. Dump and Flat Cars for Construction Work
Concrete Handling Dump Bodies
Turntables—Portable—Track—Rails, etc.
BROOKVILLE LOCOMOTIVE CO. Ford and McCormick-Dearling Type Gasoline Locomotives
ILWAUKEE LOCOMOTIVE MFG. CO. Gasoline Locomotives, 4 to 30 tons
Portable Belt Conveyors—Valves and Shutoff Gates
Steel Plate Work

HOWARD W. READ CORP.

800 N. Delaware Ave., Philadelphia, Pa.

Distributors

DOMESTIC ENGINE & PUMP CO.—Pumps
JONES SUPERIOR—Saw Rigs
LINK-BELT—Cranes and Shovels
PENNA. BOILER WORKS—Boilers
AUSTIN-WESTERN ROAD MACHINERY CO.—Rollers, Graders, etc.

Additional Equipment in Stock:

MCKIERNAN-TERRY—Hammers
INGERSOLL-RAND—Compressors
UNIVERSAL—Truck Cranes

ALLEGHENY EQUIPMENT CORP.
Grant Building Pittsburgh, Pa.

Distributors for

Allis-Chalmers" Monarch & "Hercules" Road Rollers
Industrial Tractors
"Sargent" Snow Plows
"Bulky" Gear Operated Bulldozers
"Wehr" Road Graders
"Stroud" Elevating Graders
"American" Hoists and Derricks
"American" Terry" Derricks
"Ransome" Building and Paving Mixers
"Gardner-Denver" Compressors and Drills

"Michigan" 4 1/2 yd. Shovel
"Jackson" Concrete Placement Vibrators
"Williams" Arch Girder Trailers

DIRECTORY OF DISTRIBUTORS

PENNA.—SO. CAROLINA

C. H. ARNOLD COMPANY, Inc.

Road and Street Machinery
Contractors' Equipment

726-730 Park Bldg. Pittsburgh, Penna.

Representing

THE FOOTE COMPANY... Paving Mixer
BLAW-KNOX COMPANY... Road and Sidewalk Forms,
Bins, ORD Concrete Road
Finishing Machines
INGERSOLL-RAND CO.... Compressors, Jackhammers,
Paving Breakers
LITTLEFORD BROS..... Tar and Asphalt Heating
Equipment
GENERAL EXCAVATOR CO. Gas Shovels, Cranes and
Draglines
BARNES MFG. CO..... Force Feed and Diaphragm
Type Pumps
J. D. ADAMS CO..... Earth Moving Equipment

HAVE YOU CHANGED YOUR LOCAL ADDRESS?

Sometimes in the rush of moving to a new location you fail to send us your new address. And as we are anxious to get your copy of the magazine to you on time do not put off writing us. Thank you.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave. New York

BECKWITH MACHINERY CO.

6550 Hamilton Ave. East Liberty
Pittsburgh, Pa.

Representing

"CATERPILLAR" Tractors, Graders and Trac-
tor Equipment
BYERS Shovels and Cranes
DAVEY Air Compressors
CLEVELAND Air Tools
MCKIERNAN-TERRY CORP. Pile Hammers
NATIONAL-LAMBERT Hoists, Derricks
NAGLE Boilers

A. H. KRIGGER & COMPANY

4 E. Carson St. Pittsburgh, Pa.

Representing

ORTON Cranes and Shovels
BROWN Gasoline Hoists
REED-PRENTICE Sawing Machines
BATES Crawler Tractors
STOCKLAND Road Graders
CLIMAX Gasoline Engines & Parts
LE ROI Gasoline Engines & Parts
GROUNDHOG Revolving Scrapers
McCORMICK-DEERING Tractors
IDEAL Power Lawn Mowers
LEE Dump Bodies
ACME Light Road Rollers

W. J. DOORLEY

Scottdale Penna.

Representing

Asphalt Equipment Co.
Good Roads Equipment Corp.

"All kinds of Asphalt Equipment"

ENSMINGER AND COMPANY

181 S. Washington St. Wilkes-Barre, Pa.

Representing

JAEGER Concrete Mixers, Towers, Pumps
LINK-BELT Shovels, Cranes, Backfillers
BAY CITY Tractor Shovels
SCHRAMM, INC. Air Compressors
SOUTH BEND Lathes BUTLER Bins
MUNDY Hoisting Equipment
BLAW KNOX Buckets HUBER Rollers
DOBIE Derricks and Winches
BURCH Stone Spreaders, Unloaders, Conveyors
NEW HOLLAND Rock Crushers
HIGHWAY SERVICE Chip Spreaders
JACKSON Wheelbarrows and Concrete Carts
AMERICAN Saw Mill Machinery
ADAMS Graders
REED-PRENTICE Timber Saws
CLEVELAND Rock Drills, Air Tools
SHUNK MFG. CO.—Tractor Dump Wagons
HOTCHKISS Road Forms

BRINKER SUPPLY COMPANY

6545 Hamilton Ave. (East Liberty) Pittsburgh, Pa.
Contractors' Equipment—Municipal Supplies

Representing

WARCO
HUBER
F. W. D.
LINK-BELT
BATES
BURCH
ROME
SCRAMM
UNIT
TONCAN
GOODRICH
CONNERY
MCCORMICK-DEERING
Street Signs and Signals

- One Man Power Graders
- Motor Road Rollers
- Four-Wheel Drive Trucks
- Shovels, Drag Lines, Cranes
- Steel Mules
- Car Unloaders and Spreaders
- Drawn Road Graders
- Air Compressors
- Gasoline Shovels
- Culvert Pipe
- Fire Hose
- Tar and Heating Kettles
- Tractors and Equipment

MARTIN J. O'BRIEN CO., INC.

512 Columbia Bldg.

Pittsburgh, Penna.

Nordberg-Butler Underground Shovels
Standard Gage Track Shifters Narrow Gage
Nordberg Railway Track Equipment
Bay City Tractor Shovels and Cranes
Bay City Full Revolving Shovels up to 1½ yard
Whitcomb Locomotives, Gas, Electric, Diesel
The Ohio Crusher

POWELL-DAVIES TRACTOR AND EQUIPMENT COMPANY, INC.

152 Horton St. Wilkes-Barre, Pa.

Representing

"CATERPILLAR" Tractors and Road Machinery
LA PLANT-CHOATE Wagons, Bulldozers and Snow Plows
ATHY TRUSS WHEEL Trailers
EUCLID Wagons and Bulldozers
BAKER-MANEY Wheel and Roll-Over Scrapers
WILLAMETTE-ERSTED Tractor Hoists and Logging
Equipment
DAY Crushers
DAVEY Air Compressors
W-K-M Pipe Handling Equipment
KILLEFER Road and Agricultural Tools
UNIT Shovels
DOMESTIC Pumps

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CONTRACTORS AND ENGINEERS
MONTHLY

470 Fourth Ave. New York

Pittsburgh Machinery & Equipment Company

Fulton Bldg. Pittsburgh, Pa.

Contractors' Machinery

In Stock at Aspinwall, Pa.
BUCYRUS-ERIE STEAM SHOVELS
BUFFALO-SPRINGFIELD ROAD ROLLERS

Locomotive Cranes
Dinkey Locomotives
Hoisting Engines
Concrete Mixers
Pumps, Derricks, Buckets
Rock Crushers

H. KLEINHANS COMPANY

Union Trust Bldg. Pittsburgh, Pa.

Representing

NORTHWEST ENGINEERING CO.—Crawler
Shovels and Cranes
OHIO LOCOMOTIVE CRANE CO.—Locomo-
tive Cranes
G. H. WILLIAMS CO.—Clamshell Buckets
MID-WEST LOCOMOTIVE WORKS—Gasoline
and Diesel-Electric Locomotives
BAY CITY FOUNDRY & MACHINE CO.—
Truck Cranes

GEO. W. ZIEGLER MACHY. CO.

Equipment and Supplies for
ROAD and BUILDING CONTRACTORS
MILLS — MINES — RAILROADS
528 First Avenue Pittsburgh, Pa.

Representing

CLETAC TRACTORS for Contractors, Industrial Plants
and Farmers
"BULLY" Gear Operated Bulldozers, Graders, Brush Cutters
and Snow Plows for CLETAC and "CATERPILLAR" Tractor
JAEGER Tilt and Non-Tilt Concrete Mixers, Pumps (Pressure and Centrifugal) Hoists and Concrete Towers
BUTLER Material Bins and Weighing Batches, any size
F. W. D. AUTO CO. "WAR FAMOUS" Four Wheel Drive
Trucks
"THOR" Supercharger Air Compressor
HOMELITE CORP., Centrifugal Portable Pumps and
Generators
OSGOOD Gasoline Shovels, Cranes and Drag Lines
SERVICE—STOCK SHIPMENTS—REPAIRS
Member: Associated Equipment Distributors

THE CAMERON & BARKLEY CO.

Machinery and Supplies
Contractors' Equipment
CHARLESTON, S. C. JACKSONVILLE, FLA.
MIAMI, FLA.



Distributing

"LINK-BELT" Transmission Materials
"WONDER" Tilting Concrete Mixers
HUMDINGER Power Diaphragm Pumps
C H & E Saw Rigs and Hoists
SCRAMM Air Compressors
STOVER Gasoline Engines
ROEBLING Wire Rope
WORTHINGTON Pumps
MYERS Pumps

Florida Distributors for Philip Carey Co.'s
Line of Asbestos and Asphalt Products

CAROLINA CONTRACTORS' EQUIP- MENT & SUPPLY COMPANY, INC.

P. O. Box 576 Columbia, S. C.

Representing

J. D. Adams Co.
Koehring Co.
T. L. Smith Co.
Inley Mfg. Co.
The Parson Co.
C. H. & E. Mfg. Co.
Metal Lubricant Co.
E. D. Etnyre Co.
Fox Shovels
St. Paul Hydraulic Hoist Co.
Monarch Road Mch. Co.

Sullivan Machinery Co.
Cleveland Wheelbarrow and
Manufacturing Co.
Allis-Chalmers Mfg. Co.
Hotchkiss Steel Prod. Co.
McKierman-Terry Corp.
The Geo. Haiss Mfg. Co.
American Wire Fence Co.
Fulton Bag & Cotton Mills
Trackson Co.
G. H. Williams Co.

DIRECTORY OF DISTRIBUTORS

TENNESSEE—VIRGINIA

NASHVILLE TRACTOR & EQUIPMENT CO.

322 Fifth Ave., S. Nashville, Tenn.

Representing

CATERPILLAR Tractors and Road Machinery
EUCLID Wagons & Scrapers
GARDNER-DENVER Air Compressors and Tools
SPEEDER Shovels & Cranes
LA PLANT-CHOATE Builders, Wagons & Scrapers
IOWA MFG. COMPANY Crushers, Planta, Mixing Plants
KILLEFER Scrapers

GENERAL Wheelbarrows, Scrapers and Blades
HAISS Loaders & Conveyors
WILLIAMS Buckets and Trailers
ATHY TRUSS WHEEL Wagon
DOMESTIC Pumps & Hoists
TOLEDO Torches
BURTON Explosives
CARTER "Humdinger" Pumps

SHEEHAN & COMPANY

El Paso Texas

Representing

CATERPILLAR Tractor Co. Barber-Greene Co.
Killefer Mfg. Co. Smith Engineering Works
Northwest Engineering Co. Cleveland Rock Drill
Chain Belt Co. Athey Truss Wheel Co.
Clyde Iron Works LaPlant-Choate
Sauerman Bros. Willamette-Ersted Co.
Schramm, Inc. W-K-M Co.
LeRoi Co. American Tractor Equip. Co.
Member: Associated Equipment Distributors All Steel Products Mfg. Co.

ALAMO IRON WORKS

130 Santa Clara St., San Antonio, Tex.

Koehring Shovels, Cranes Sidney Woodworking Machinery
Insley Shovels, Cranes Hause Loaders and Conveyors
Koehring Pavers, Mixers Butler Bins
Smith Pavers, Mixers Williams Buckets and Heavy Duty Trailers
Parsons Ditchers, Backfillers Rad Star Barrows
Koehring Dumpers Telsmith Crushers, Screens Moly Shovels
Telsmith Crushers, Screens Eintrude Pumps
Schramm Portable Compres- Waugh Rock Drills
Gardner Stationary Com- Black & Decker Electric Hammers
pressors Orr and Sembower Hoists Jones Superior Woodworkers
H & A Woodworking Machinery Black & Decker Electric Saws
Williamsport Wire Rope

Wilson-Weesner-Wilkinson Co.

Nashville Tennessee

NATIONAL EQUIPMENT CO.

Koehring Co. The Parsons Co. T. L. Smith Co.
Insley Mfg. Co. Ingersoll-Rand Co.
Blaw-Knox Co. Littleford Bros.
C. H. & S. Mfg. Co. McKiernan-Terry Corp.
Clyde Iron Works Western Wheeled Scraper Co.
Elliott Dredges and Machinery Wyoming Shovel Works
Good Roads Machy. Co. Warehouse Stocks of Service
NASHVILLE — KNOXVILLE
MEMPHIS

Member: Associated Equipment Distributors

Steel Products Corporation

750-760 First Natl. Bank Bldg.

P. O. Box 23

El Paso, Texas

Exclusive Distributors

CEDAR RAPIDS Crushers, Screening Plants, Washing Plants and Oil Surfacing Machines

CHAUSSE Asphalt Heaters and Asphalt Paving Plants

CHADWICK MACHINERY CO.

125 Blue Star St. San Antonio, Tex.

Representing

Austin-Western Rd. Machy. Co.
Austin Machinery Corp.
Bay City Crane & Winch Co.
Blaw-Knox Co.
Chain Belt Co.
Milwaukee Locomotive Mfg. Co.
Mundy Hoisting Engine Co.
Northwest Engineering Co.
Saggen Derrick Co.
Sauerman Bros., Inc.
Sterling Machinery Co.
Sterling Wheelbarrow Co.
Sullivan Machinery Co.
H. W. Weimer Co.

J. W. BARTHOLOW COMPANY

Machinery Contractors' Equipment and Supplies
1221 So. Lamar St. Dallas, Texas

RANSOME Mixers, Chutes
CLYDE Hoists & Derricks
BLYSTONE Plaster Mixer
DOMESTIC Pumps
WYOMING Shovels, Picks
GENERAL Wheelbarrows
WIARD Plows
CYCLONE Drills
SULLIVAN Air Compressors
McKIERNAN-TERRY Pile Hammers

ROOS Shores
NORTHWEST Cranes
BLAW-KNOX Buckets
RANSOME Pavers
ORD Concrete Finishers
ACME Rollers, Graders
HAISS Loaders
BLAW-KNOX Bins, Forms
TELMSMITH Crushers, Etc.
AUSTIN Ditchers
BAY CITY Truck Cranes

Member: Associated Equipment Distributors

FRANCIS WAGNER COMPANY

307 San Francisco St. El Paso, Texas

Representing

KOEHRING—Pavers, Mixers, Shovels, Cranes, Dumpers, Buckets, Derricks
INSLEY—Excavators, Concrete Placing Equipment, Cars, Buckets
T. L. SMITH—Pavers, Mixers, Weigh-Mix
PARSONS—Ditchers, Backfillers
C. H. & E.—Pumps, Saw Rigs, Hoists, Material Elevators
KWIK-MIX—Concrete, Plaster and Mortar Mixers
RED EDGE—Shovels and Picks
CLEVELAND ROCK DRILLS—Hose and Accessories
COLUMN CLAMPS and Form Ties
AUSTIN-WESTERN ROAD MACHINERY CO.
BLAW-KNOX CO.
CLIMAX Engines
LE ROI Engines
FULLER & JOHNSON Engines
DAVEY—Air Compressors—Portable

THE C. H. JONES COMPANY

Construction and Industrial Equipment
134-140 Pierpont Ave. Salt Lake City, Utah

Representing

JAEGER MACHINE CO.—Concrete Mixers, Hoists & Pumps
GALION IRON WORKS & MFG. CO.—Road Graders and Rollers
BAY CITY SHOVELS, INC.—Power Shovels, Draglines and Cranes
OHIO POWER SHOVEL CO.—Lime "101" Shovels, Draglines and Cranes
DIAMOND IRON WORKS, INC.—Gravel Crushing and Screening Plants
THE FOOTE CO., INC.—Multifoot Paving Mixers
LINK BELT CO.—Elevating and Conveying Machinery
CLEVELAND TRACTOR CO.—Cletrac Crawler Tractors
CHICAGO AUTOMATIC CONVEYOR CO.—Portable Belt and Drag Conveyors
BAKER MFG. CO.—Truck and Tractor Snow Plows

BROWNING-FERRIS MACHY. CO.

205 Exposition Ave. Dallas, Texas
Houston—Austin—San Antonio

Representing

Buffalo-Springfield Roller Co. (Dallas & Amarillo)
Barber-Greene Co. (Dallas & Amarillo)
Lakewood Engineering Co.
Sterling Wheelbarrow Co.
Jaeger Machine Company
Heltzel Steel Form & Iron Co.
Ingersoll-Rand Co.
Footh Co.—Pavers
Homelite Corp.—Pumps
Littleford Bros.
Universal Crushers
Tew Shovel Co.
Trackson Co. Crawlers, Hoists
McCormick-Deering Tractors

R. B. EVERETT & CO.

3112-18 Harrisburg Blvd. Houston, Texas

BLAW-KNOX Road Plant Equip., Bins & Clamp Shell Buckets
CHAIN BELT Concrete Mixers, Pumps, etc.
CLYDE Hoisting Machy.
"P. & H." Gasoline Cranes
ALLIS-CHALMERS "United" and "Monarch" Tractors
UNIVERSAL Form Clamps
McKIERNAN-TERRY Pile Hammers, etc.
NOVO Engines, Hoists
CONNERY Asphalt Kettles, Tools
WYOMING Shovels, Picks
Member: Associated Equipment Distributors

LEWTER F. HOBBS, INC.

"Any machine for the Contractor since 1906"

NORFOLK, VIRGINIA

KNICKERBOCKER Mixers
STROUDSBURG Hoists
CHICAGO Compressors
U. S. ASPHALT Plants
FAIRFIELD Conveyors
FARQUHAR Boilers
FREEMAN Turntables

Other Well Known Lines

CLARK & BURROWS, Inc.

3600 Commerce St., Dallas, Texas

Representing

KOEHRING—Pavers, Mixers, Power Shovels, Cranes, Draglines, Dumpsters
INSLEY—Excavators, Concrete Placing Equipment, Cars, Buckets, Derricks
T. L. SMITH—Tilting and Non-Tilting Mixers, Pavers
PARSONS—Trench Excavators, Backfillers, Trailers
G. H. & E.—Portable Saw Rigs, Pumps, Hoists
KWIK-MIX—Mixers; Concrete, Plaster and Mortar
G. S. JOHNSON—Material Storage Bins and Batcher
CHICAGO PNEUMATIC—Portable Air Compressors, Tools
METAL FORMS CORP.—"Metaform"
CONSOLIDATED IRON-STEEL MFG. CO.—Cleveland Road Torch
GOOD ROADS—Rock Crushers, Sand and Gravel Plants, Road Graders
A Complete Line of Construction Equipment

F. W. GARTNER COMPANY

1010 Milby Street Houston, Texas

Contractors Equipment

RANSOME Mixers & Pavers
JOHNSON Bins, Batcher
LIMA Cranes, Shovels
AUSTIN Trenchers, Backfillers
BARNES Pumps
HAISS Loaders, Conveyors
KOPPEL Cars
MUNDY Hoists Distributors
BLYSTONE Mixers
SCHRAMM Compactors
SASGEN Concrete Equip.

Member: Associated Equipment Distributors

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Sometimes in the rush of moving to a new location you fail to send us your new address. And as we are anxious to get your copy of the magazine to you on time do not put off writing us. Thank you.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave. New York

GRAHAM B. BRIGHT

901 Electric Bldg.
Geo. Haiss Mfg. Co.
Bay City Fdy. & Mach. Co.
Lidgerwood Mfg. Co.
The T. L. Smith Co.
Koehring Co.
The Parsons Co.
Insaey Manufacturing Co.
Kwik-Mix Concrete Mixer Co.
C. H. & E. Manufacturing Co.

Richmond, Va.
Smith Engineering Works
E. D. Etnyre & Co.
Ame Road Machinery Co.
American Wire Fence Co.
C. S. Johnson Co.
Milwaukee Locomotive Mfg. Co.
J. C. Cleaver Co.
National Brake & Electric Co.

RICHMOND MACHINERY & EQUIP. CO.

Broadway Bank & Trust Bldg. Richmond, Va.

Representing

Cleveland Rock Drill Co.
Convery and Co.
Construction Machinery Co.
Farquhar and Co.
Galion Iron Works and Manufacturing Co.
Good Roads Machinery Co.
Manitowoc Engineering Works
Mead-Morrison Manufacturing Co.
Page Steel and Wire Co.
Schramm Incorporated
Virginia Metal Manufacturing Co.

EARNEST BROS.

805 E. Franklin St. Richmond, Va.

Representing

BLAW-KNOX Steel Forms, Steel Bins, Measuring Batches, Clamshell Buckets, Turntables, Inundation, Agitating Truck Bodies
ORD Concrete Finishing Machines
KEYSTONE Gas & Steam Excavators, Shovels
CHAIN BELT—Pavers, Building Mixers, Pumps, Saw Rigs, Mortar and Plaster Mixers, and Conveying Machinery
DOW CHEMICAL CO. "Dowflake" Calcium Chloride

*And Other Well Known Manufacturers***SMITH-COURTNEY COMPANY**

7th & Bainbridge Sts. Richmond, Va.

Representing

JAEGER—Mixers, Hoists and Pumps
METALWELD—Air King Compressors
CLEVELAND—Rock Drills
HOMELITE—Portable Pumps
CYCLONE—Road Guard
LAKEWOOD—Towers
SKILSAW—Electric Saws
BEEDE—All Steel Hand Hoists

*Complete Stock of Contractors' Supplies and Accessories***WE DO NOT CHOOSE TO RUN—**

anything in this Directory that is not accurate and up-to-date. Therefore, if you find any errors or corrections we hope you will let us know about them. Thank you.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave. New York

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CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave. New York

Southern Machinery & Supply Co.

Roanoke Virginia

"All Kinds of Machinery"

Austin-Western Road Machinery Co.
The Oregon Co.
Vulcan Iron Works
Ingersoll-Rand Co.
Chain Belt Co.
The Novo Engine Co.
Austin Machinery Corp.
George Haiss Manufacturing Co.
Hiltzsel Steel Form & Iron Co.

*Contractors' Equipment in Stock in our Roanoke Warehouse***A. H. COX & COMPANY, INC.**

1757 First Avenue, S., Seattle, Wash.

Representing

REX Mixers and Pavers
REX Saw Rigs, Plaster Mixers and Pumps
WILLIAMS Clamshell Buckets and Trailers
CONTINENTAL "Red Seal" Industrial Engines
RED STAR Carta, Shores and Clamps
AMERICAN Floor Surfers
ARCHER Towers and Chuting Equipment
PLYMOUTH Locomotives
INGERSOLL-RAND Compressors and Air Tools
VULCAN Pile Hammers
Member: Associated Equipment Distributors

NATIONAL Hoists
BUTLER Bins
GENERAL Excavator
HOMELITE Pumps
BINKS Paint Spray Equip.
NORDBERG Tunnel Master and Track Shifters
LINK-BELT Shovels and Cranes
BLYSTONE PRODUCTS Plant Mixers
WESTCO-CHIPPEWA Pumps
BUCKEYE Ditches and Backfillers
Member: Associated Equipment Distributors

ED.P.PHILLIPS MACHINERY CO.

900 East Cary St. Richmond, Va.

Representing

RANSOME CONCRETE MACHINERY CO.
CLYDE IRON WORKS SALES CO.
DeWALT PRODUCTS CORP.
HARNISCHFEGER SALES CORP.
ERIE STEEL CONSTRUCTION CO.
SAUERMAN BROTHERS, INC.
CHICAGO PNEUMATIC TOOL CO.
DRAVO EQUIPMENT CO.
STEPHENS-ADAMSON MFG. CO.
METAFORMS CORPORATION
ROGERS BROTHERS CORP.
GENERAL EXCAVATOR
AEROL BURNER CO.
RALPH B. CARTER CO.

Also many other lines of Contractors' Equipment

VIRGINIA TRACTOR CO., Inc.

North Boulevard Richmond, Va.

Dealers in Equipment, Attachments and Implements for use with

"CATERPILLAR" Tractors
"CATERPILLAR" Graders
"CATERPILLAR" Combines

JOS. S. POTTS, JR. COMPANY*Factory Sales Engineers*

Travelers Bldg. Richmond, Va.

Representing

Bucyrus-Erie Co. A. Leschen & Sons
G. H. Williams Co. Rope Co.
McKinnon-Terry Corp. Browning Crane & Shovel Co.
Deister Concentrator Sprague Electric Hoists
Co. Gardner-Denver Co.
National Wire Cloth Co.

and other leading manufacturers

D. S. MEADOWS COMPANY, Inc.

19 Church Ave., E. Roanoke, Va.

Representing

CATERPILLAR TRACTOR CO.
"CATERPILLAR" Harvesters
"CATERPILLAR" Graders
ATHHEY TRUSS WHEEL CO.
LA PLANT-CHOATE MFG. CO.
KILLEFER MFG. CO.
TOWERS & SULLIVAN MFG. CO.
GENERAL EXCAVATOR CO.

GEIJSBEEK ENGINEERING CO.

Arctic Building Seattle, Wash.

Representing

HANSON Excavators
FATE-ROOT-HEATH Crushers
EAGLE Sand and Gravel Plants
CHASE Industrial Cars
HARDINGE Grinding Mills
Pumps, Compressors, Drilling Tools
Contractors' Scientific Instruments

DIRECTORY OF DISTRIBUTORS

WASHINGTON—WISCONSIN

PACIFIC HOIST & DERRICK CO.

Machinery and Equipment
518 First Ave. S Seattle, Wash.

Representing

NORTHWEST—Gas and Electric Shovels, Cranes and Draglines
BUHL—Air Compressors
TWIN DISC—Clutches for all purposes
PAGE—Scraper Buckets, Diesel Draglines
MINNEAPOLIS—“Twin City” Gas Engines
CLIMAX—Gasoline Engines
WISCONSIN—Gasoline Engines
MIDWEST—Locomotives
DAKE ENGINE CO.

Member: Associated Equipment Distributors

Bluefield Supply Company

Bluefield

W. Va.

Representing

Blaw-Knox Co. Diamond Rubber Co.
Ingersoll-Rand Co. E. I. DuPont de Nemours & Co.
National Equip. Corp. Johns-Manville Corp.
Novo Engine Co. WilliamSPORT Wire Co.
Cleveland Tractor Co. Hercules Mfg. Co.
Street Bros. Mach. Wks.
American Saw Mill General Electric Co.
Machy. Co.

Authorized Waukesha Service

WE WOULD LIKE TO HAVE YOU HELP US

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave. New York

CONSTRUCTION EQUIPMENT CO.

118-24 Ide Ave. Spokane, Wash.

Archer Iron Works M. & M. Wire Clamp Co.
Beebe Bros. Niagara Mfg. Co.
Blystone Mfg. Co. Novo Engine Co.
Broderick & Bascom Rope Co. Osgood Co.
Buffalo-Springfield Roller Co. St. Regis Paper Co.
Butler Bldg. Co. Sanger Derrick Co.
Chair Belt Co. Snelson Mfg. Co.
D-A Lubricant Co. Spender Mfg. Corp.
Detroit Graphite Co. Sterling Wheelbarrow Co.
DeWalt Products Co. Sullivan Machinery Co.
Elgin Sales Corp. Sunbeam Mfg. Co.
Fate-Roof-Heath Co. Templeton, Kanly Co.
Climax Eng. Co. Kalamazoo Railway Supply Co.
Ideal Power Lawn Mower Co. G. H. Williams Co.
Le Roi Co. Willamette Ersted Co.
Linde Air Products Co. Wyoming Shovel Works
Falkbanks, Morse & Co. Young Iron Works

Member: Associated Equipment Distributors

GENERAL EQUIPMENT CO., Inc.

414 No. Fourth St. Clarksburg, W. Va.

Representing

CATERPILLAR TRACTOR CO.—Tractors, Graders
DETROIT HARVESTER CO.—Street Sweepers, Mowers
KILLEFER MFG. CORP.—Plows and Discs
HUBER MFG. CO.—Gasoline Rollers
ATHHEY TRUSS WHEEL CO.—Crawler Wagons
GARDNER-DENVER CO.—Compressors and Jackhammers
STERLING WHEELBARROW CO.—Wheelbarrows
BLAW-KNOX CO.—Road Forms, Batchers, Bins, etc.
LA PLANT-CHOATE MFG. CO.—Bulldozers Snow Plows
AMERICAN CABLE CO.—Tru-Lay Rope
BURCH CORP.—Conveyors, Car Unloaders and Spreaders
NORTHWEST ENGINEERING CO.—Gasoline Shovels
BARNES MFG. CO.—Pumps
JAEGER MACHINE CO.—Concrete Mixers
HERCULES POWDER CO.—Explosives & Blasting Supplies
EUCLID ROAD MACHY CO.—Earth Moving Equipment.
DAY—Crushers

Badger Tractor & Equipment Co.

371 No. 25th St. Milwaukee, Wisc.

Representing

Allis-Chalmers Mfg. Co.
Galion Iron Works & Mfg. Co.
Diamond Iron Works, Inc.
Sterling Motor Truck Co.
Schramm (Air Compressors)
Fruehauf (Trailers)
Atlas Scraper Co.
Geo. Nelson Co.
Rotary Snow Plow Co.
Baker Mfg. Co.
Sidney Steel Scraper Co.
Wausau Iron Works
“Monarch” Plows
Killefer Scrapers, Rippers
Davenport Locomotive & Mfg. Corp.

GENERAL MACHINERY CO.

East 3500 Block Riverside Avenue Spokane Washington

Representing

Ohio Power Shovel Co.
General Excavator Co.
Bay City Shovels, Inc.
Smith Engineering Works
Jaeger Machine Co.
Chicago Pneumatic Tool Co.
Superior Engine Co.
Hercules Motors Corp.
DeLaval Steam Turbine Co.
Howell Electric Motors Co.
John A. Roehlings Sons Co.
Cleveland Wheelbarrow Co.
Midwest Locomotive Works

Member: Associated Equipment Distributors

BAILEY-TREEN MACHINERY CO.

20th St. & B. & O. R. R., Huntington, W. Va.

Representing Sales-Service for the Following Internationally Known Material Moving Machinery Manufacturers

Caterpillar Tractor Co.
Athey Truss Wheel Co.
LePlante-Cheate Mfg. Co.
Northwest Engineering Co.
Euclid Road Machinery Co.
Detroit Harvester Co.
Day Pulverizer Co.
Williamette Iron & Steel Works
Gardner-Denver Co.
The Huber Co.
W-K-M Co., Inc.
Erie Steel Construction Co.
The Burch Corporation
The Footh Co.
American Tractor Equip. Co.

BOEHCK MACHINERY CO., INC.

2404 W. Clybourn St., Milwaukee, Wis.

Representing

MUNDY Hoisting Equip., INGERSOLL-RAND AIR
Gravel Plants, Stationary COMPRESSORS
and Portable Conveyors J. P. CURRY Wire Ties
JOHNSON Bins TOEPEL Screening and
ALLIS-CHALMERS Motors, CONVEYING EQUIPMENT
Pumps SYMONS Column Clamps
WILLIAMS Buckets WAUKESHA Industrial Power
WILLIAMS Trailers UNITS
BAY CITY Truck Cranes UNION File Hammers

Member: Associated Equipment Distributors

HOFIUS-FERRIS EQUIPMENT CO.

728-802 Mallon Avenue Spokane Washington

Road Building, Logging and Power Farming Equipment

Representing

CATERPILLAR TRACTOR CO.
Tractors — Graders — Harvesters

SHOP — SERVICE

THE PORTER SUPPLY CO.

P. O. Box 736 Huntington, W. Va.

Representing

BUCYRUS-ERIE CO.—Steam, CONNERY Asphalt Heaters
Gas and Diesel Shovels GOODALL Rubber Hose
ALLIS-CHALMERS “Mee- BUFFALO-SPRINGFIELD
arch” Tractors Rollers
J. D. ADAMS CO.—Graders IOWA MFG. CO.—Sand and
THE HUG CO.—Dump Trucks Gravel Screen Plants
SULLIVAN Compressors, GEO. D. WHITCOMB Locomotives
Tools
DOMESTIC Pumps and WESTERN Dump Cars
Hoists HAZARD Wire Rope
BLAW-KNOX Bins, Batchers M-W Lubricants
and Forms W. K. M. COMPANY INC.
A. W. FRENCH CO.—Finishing Machines NATIONAL CARBON CO.
Graphite Grease

CHADWICK MACHINERY CO.

Contractors' Equipment 2460 Clybourn St. Milwaukee, Wis.

Representing

Barber-Greene Co.
Broderick & Bascom Rope Co.
Drake-Williams-Mount Co.
Independent Pneumatic Tool Co.
Leach Company
Manitowoc Engineering Works
Mead-Morrison Mfg. Co.
Owen Bucket Co.
Sterling Machinery Corp.
Universal Power Shovel Co.

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CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave. New York

T. W. MEIKLEJOHN CO.

520 No. Main St. Fond du Lac, Wis.

Representing

Speeder Machinery Corp.
W. A. Riddell Co.
Sauerman Bros., Inc.
Wehr Co.
Trackson Co.
Willamette-Ersted Co.
Fordson Distributor in Wisconsin,
Illinois, Iowa, Indiana and Michigan

DROTT TRACTOR CO., INC.

3841 Wisconsin Avenue Milwaukee Wisconsin

Representing

CATERPILLAR TRACTOR CO.—Tractors,
Road Machinery and Harvesters
HI-WAY SERVICE CORP.—“Wausau” Snow
Plows and Equipment
ILLINOIS WIRE & MFG. CO.—“Big Red”
Snow Fence
EUCLID ROAD MACHY. CO.—Crawler Wa-
gons, Wheel and Rotary Scrapers
PIONEER GRAVEL EQUIPMENT MFG. CO.
—Gravel Handling Equipment & Crushers

ENGINEERS AND CONTRACTORS SUPPLY COMPANY

Office: 840 No. 3rd St. Milwaukee, Wis. Warehouse: West Allis Wisconsin

Representing

Browning Crane & Shovel Co.
Remmel Concrete Mixer Co.
Belmont Packing & Rubber Co.
Whiting Leather & Belting Co.

Complete line of Concrete Product Equipment.
Block, Brick and Tile Machines.

CANADA

Alberta
British Columbia
Manitoba
Ontario
Quebec
Saskatchewan

HUNTER MACHINERY COMPANY

327 So. 16th Street, Milwaukee, Wis.
Aeroll Heaters, Torches
Archer Towers
Bates Wire Ties
Blaw-Knox Bins, Batchers, Forms, Ready-Mix Concrete Plants, Wagon Graders, etc.
Brookville Locomotives
Buffalo-Springfield Rollers
Burch Conveyor, Crackfillers, Unloaders
Chain-Belt Concrete & Truck Mixers, Pavers, Pumps
Cleveland Graders, Scrapers
Clyde Hoists, Derricks
Homelite Pumps
Hughes-Keenan Iron Mules
Member: Associated Equipment Distributors

Johnson Fire Pumps
Le Ro Gas Engines
Loeschen Wire Rope
McCormick-Deering
Montgomery-Shouldering Machines
M & M Clamps
Montgomery-Shears, Cranes
Ord Finisher Machines
Pulverizer Steam Pumps
First Star Wheelbarrows
Ross Snow Plows
Sassage Derricks, Winches
Sauerman Scrapers, Draglines
Sullivan Compactors, Tools
Syntron Electric Hammers
Trackson Crawlers, Bulldozers, Hoists, Shovels
Western Scrapers
Equipment Distributors

THE CENTRAL GARAGE

Medicine Hat Alberta, Can.

Representing

CATERPILLAR TRACTOR CO.—Tractors and Road Machinery

LA PLANT-CHOATE MFG. CO.—Bulldozers and Wagons

KILLEFER MANUFACTURING CO.—Scrapers and Road Rippers

ATECO—Dirt Movers, Bulldozers, Tamping Rollers and Scarifiers

Also

Horse Drawn Road Maintenance Machines
Fresnos, Scrapers, Etc.

WILLARD EQUIPMENT, LIMITED

Vancouver, British Columbia, Canada
Municipal and Construction Supplies
Representing

SAWYER MASSEY, LTD. CO., LTD., London, Eng.—Vertical Retort Ovens
Hamilton Ont., Rd. McPh. THE PEDLAR PEOPLE, LIMITED, Oshawa, Ontario
Kanawha City, Mo.—Gasserine Saws, Pumps & Engines
Montreal, Quebec—Sheet Metal Products
FRANCIS PANKIN & CO., LTD.—Montreal, Quebec—Water Meters, Etc.
RANSOMES SIMS & JEFFERIES, LTD.—Ipswich, Eng.—Lawn Mowers
DENNIS BROS., LTD., Guilford, Eng.—Lawn Mowers
WOODALL—DUCKHAM VERTICAL RETORT & OVEN CONSTRUCTION
CONSTRUCTION MACHINERY CO.—Waterloo, Ia.
Concrete Mixers, Hoses
CANADIAN JOHNSON MOTOR CO., Peterboro, Ontario—Motor Scythes and Johnson - Tremblay Flying Pumps

W. A. NELSON EQUIPMENT CO.

534 No. 25th St. Milwaukee, Wis.

Representing

BYERS—Shovels, Cranes, Draglines
METALWELD-WORTHINGTON—Portable Air Compressors, Air Tools
CONSTRUCTION MACHINERY CO.—Pumps, Hoists, Saw Rigs, Material Elevators
NOVO—Engines, Pumps, Hoists
SHUNK—Grader Blades
STERLING—Wheelbarrows
ERIE—Bins, Clamshell Buckets
WHEELBARROW SCALE CO.

FERGUSON SUPPLY CO., Ltd.

CALGARY ALBERTA

Representing

Northwest Engineering Co.
Page Engineering Co.
B. Greening Wire Co., Ltd.
London Concrete Mch. Co., Ltd.
Canadian Mead-Morrison Co., Ltd.
Herbert Morris Crane & Hoist Co. Ltd.
Worthington Pump & Mch. Corp.
Templton, Kenly & Co., Ltd.
Federal Belting & Asbestos Co., Ltd.
Moon Manufacturing Co.
Factory Equipment Ltd.
J. L. Goodhue & Co., Ltd.
Jeffrey Manufacturing Co.
Elevating Graders, Dump Wagons,
Fresnos, Scrapers, Plows, etc.

KIPP-KELLY, Ltd.

68 Higgins Ave. Winnipeg, Manitoba

Representing

NOVO—Engines, Hoists, Pumps, Draglines, etc.
GARDNER-DENVER—Air Compressors, Tools
KELLER Pneumatic Riveters, Calkers, Drills
LUDGERWOOD—Hoists, Derricks, Excavators, etc.
ORENSTEIN & KOPPEL—All Types Industrial Care PETTERS—Oil Engines and Generating Sets
WHITCOMB—Gasoline, Oil, Electric Locomotives
MORRIS—Cranes, Hoists, Blocks, Crane Trucks
—REPAIR PARTS AND SERVICE SHOPS

ROBERT T. TWEDT CO., INC.

15th St. and Pioneer Ave. Cheyenne, Wyo.

Representing

"CATERPILLAR" Tractors and Graders
LaPLANT-CHOATE Snow Removal and Dirt Moving Equipment
KILLEFER Scrapers, Fresnos & Road Rippers
ATHHEY TRUSS Wheel Wagons
EUCLID Road Machinery
MACWHYTE Wire Rope
OIL FIELD Hoists and Equipment
GOOD ROADS Champion Sand & Gravel Equip.
WIARD Road Plows
WAUSAU Bulldozers, Snow Plows and Back Fillers
SPEEDER Draglines and Shovels
MASTER Loaders and Rotary Scrapers
DETROIT Mowers, Sweepers & Snow Brushes
WILLIAMS Buckets and Heavy Duty Trailers

BROWN, FRASER & CO. Ltd.

Vancouver British Columbia, Can.

Representing

BAY CITY Shovels and Cranes
CASEY JONES Speeders
CEDAR RAPIDS Gravels Plants, Crushers
CLETRAC Tractors
GALION Road Machinery
HAISS Mechanical Loaders and Excavators
HUMDINGER Pumps
PLYMOUTH Gas and Diesel Locomotives
SAUERMAN Scrapers and Excavators

LONDON CONCRETE MACHY. CO.

Limited CANADA

Representing

ARCHER Tower Hoist Equipment
BLACKMER Pumps
CONSOLIDATED Concrete Machinery
FOOTE Pavers
NOVO Gasoline Engines
Concrete Mixers—Tilting and Non-Tilting
Concrete Block Machines
Cement Brick Machines
Hoisting Engines
Centrifugal, Diaphragm and Rotary Pumps
EVERYTHING FOR THE CONTRACTOR

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CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave. New York

MORRISON TRACTOR & EQUIPMENT CO. Ltd.

940 Station St. Vancouver, B. C.

BRITISH COLUMBIA DISTRIBUTORS FOR

Caterpillar Tractor Co.
Tractors—Graders—Combines
Pioneer Gravel Equipment Mfg. Co.
American Tractor Equip. Co.
LaPlant-Choate Mfg. Co.
Athey Truss Wheel Co.
Killefer Mfg. Corp.
Rotary Snow Plow Co.
Detroit Harvester Co.
Day Pulverizer Co.

TRUCK & TRACTOR EQUIPMENT CO., LTD.

661 Queen St., E. Toronto, Canada

Representing

Hughes-Keenan Co.
Trackson Co.
W. A. Riddell & Co.
Universal Power Shovel Co.
Taco Governor
Fordson Tractors
Sargent Snow Plows
Osgoode Co.
Trucktor Corp.
Hughes-Keenan Iron Mules
Olson Extensions
Rock Hand Hoists
Perry Scraper Co.
Kingham Trailers
Brookville Locomotives
General Excavator Co.
Trojan Road Rippers
Bates Tractors
Willette Mfg. Co.

DIRECTORY OF DISTRIBUTORS

CANADA—CUBA—WEST COAST OF MEXICO—PANAMA

VULCAN ASPHALT & SUPPLY CO., LTD.

2258 Bloor St. W. Toronto, Canada

Representing

Barber Asphalt Co.

Thos. Moulding Floor Co.

National Wood Products Co.
Canadian Asphalt Co., Ltd.

JUST EQUIPMENT & SUPPLY CO., LTD.

173 Colborne St. Montreal, Canada

Representing

Athey Truss Wheel Co.
Automatic Signal Corp.
Buffalo-Springfield Roller Co.
Caterpillar Tractor Co.
F. D. Cummer & Son Co.
E. D. Emery & Co.
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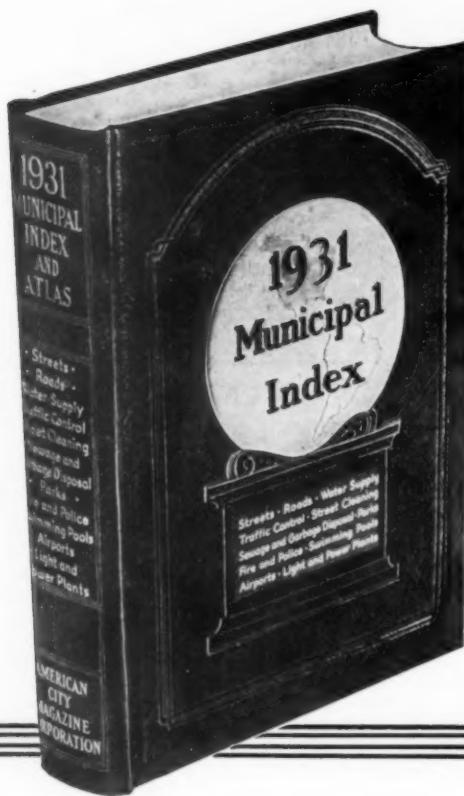
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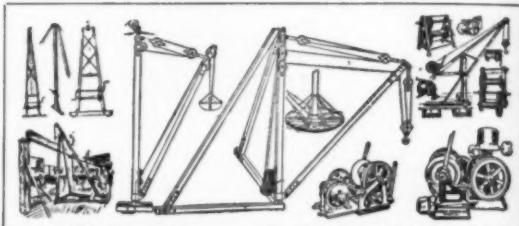
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